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Author(s)	MIYAKE, Kazuo; WAKAI, Kunio; TAJIMA, Nobumoto; HAMANA, Tsuguyo; ITOH, Norihiro; GOTOH, Mamoru; USUI, Hiroshi
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A LONGITUDINAL STUDY ON THE MOTHER-CHILD RELATIONSHIPS AND CHILD'S BEHAVIORAL DEVELOPMENT

Kazuo Miyake, Kunio Wakai, Nobumoto Tajima, Tsuguyo Hamana,
Hokkaido University
Norihiro Itoh, Mamoru Gotoh, and Hiroshi Usui,
Hokkaido University of Education

SUMMARY

This interim report contains descriptions of the goals, sample, methods and tentative findings of the longitudinal study on the mother-child relationships and child's behavioral development.

The study has already covered the child's prenatal period and the first ten years of life, and the data collection is to be continued for several years to come. The need for continuous assessment of the reciprocal relations between the mother and child is stressed to determine how the interactions between the two accelerate or prevent the child's development.

INTRODUCTION

This is the interim report of a longitudinal study on the mother-child relationships and behavioral development in infancy and childhood launched in 1966. As is shown in Kagan's report (3) of a survey of selected longitudinal programs, longitudinal projects are not rare in the United States. In Japan, however, there was scarcely any research of that kind at that time. Our motive to start a longitudinal study was to replace cross-sectional and retrospective data on child development with actual data on the sequence of events by which social, emotional and cognitive behaviors develop in the child. Not only retrospective and cross-sectional studies but also laboratory studies of interactions between the child and experimenter had not supplied us with direct and actual information on the child. Most of the American longitudinal studies reported by Kagan were started in the 1920's or 30's and invaluable as their findings had been, the data collection was based on the concepts and methods of that era. Consequently we have very little information on how the mother and child change over time and how these changes are related to the variables of mother and child characteristics.

In addition to the purpose of tracing the actual course of development, we intended to carry out a study to answer the questions of whether the characteristics of the mother existed first in the course of child development, followed by the child characteristics as a response, or vice versa. We thought that the interactional longitudinal study should replace the past socialization research demonstrating correlations between the mother and child variables at a single point in time and regarding the mother characteristics as antecedents and the child variables as consequents.

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Until the middle of the 1960's when our longitudinal project was started, most studies on mother-child relations had tended to regard the relationships as unidirectional processes from mother to child. Among the few research publications in which the parent-child relationship was regarded as reciprocal and to which we referred when planning our own project was the paper by Thomas et al. (12). They demonstrated that biological predispositions and reaction patterns, along with early acquired characteristics and the immediate physical state of the infant, greatly influenced the effectiveness of parent behavior. In another publication Thomas et al. (13) reported the changes that occur in the child's temperament as a function of the interactions with his home environment. When they examined the relationship between behavioral characteristics in the first and fifth years of life, few significant correlations were found. For example, if the parents were able to adjust to the child's difficult temperament, a good behavioral outcome was likely. If not, the difficulties were exacerbated and behavioral disturbance often resulted. Such being the case, the parent-child relationship was not only the unidirectional influence of the parents on the child, but also the reciprocal influence of the child on the parents. From the findings of Thomas et al. it appears that it is the nature of the specific interactions that occurred between the child and his parents which determined the course of his development.

During the last ten years, the study of mother-infant reciprocal interaction found quite a few advocates. Moss (11) studied infants at 3 weeks and at 3 months. He suggested that maternal responsiveness initially tends to be under the control of the stimulus conditions provided by the infant. As the infant grows older, however, if the mother responds contingently to the infant's signals, her efficacy in regulating his behavior increases. Concurrently, the infant's control diminishes until a balance is reached. In a longitudinal study of mother-infant interactions, Clarke-Stewart (2) was able to show a complex reciprocity between mother and infant. She suggests that as mother and child seek a balanced interaction first one and then the other assumes a causal role. Thus the number of publications of the research on mother-infant interaction has increased rapidly. Most of the studies on mother-child interaction, however, have been those on mother-infant interaction. Studies in which the mother-child reciprocal interaction process is followed through childhood are non-existent as far as we know.

Another point which we wished to make was to devote sufficient attention to the sequential interaction process when observing and analyzing the mother-child interaction at a single point in time. Previous research studies did not do so. Most of the results of previous studies concern the frequencies of a given behavior in either mother or child, but do not explore in more than a gross way the effects of one person's behavior on another's. Our preliminary observation of mother-child interaction revealed that it sometimes happened that very few words from the mother were effective in stimulating the child and making him work devotedly. Merely counting the overall frequencies of the mother's utterances or acts does not tell us whether or not she is effective in dealing with her child. This fact refers to the contingencies between mother's behavior and child's behavior. In order to know how the mother's behavior relates to the child's behavioral development and how the child's behavior regulates the mother's behavior, we must grasp their interactions contingently, relationally and contextually.

Based on the purposes stated above, the strategy at the onset of our project was to

study the characteristics of the expectant mother prior to the birth of the child, and the child's temperamental characteristics early in life before they had been modified considerably by his mother and his home environment.

An interdisciplinary research team composed of obstetricians, midwives and psychologists studied pregnancy, delivery and lying-in periods. The second team of pediatricians, nurses and psychologists studied mother-child interaction and child characteristics in the first three years of the child's life. The preschool and school age periods were studied by the third team of psychologists and graduate students of Hokkaido University. Each team of specialists selected the content to be studied and methods to be used for their respective investigations. Nonetheless, selection of the content of each investigation was guided by the goal of eventually integrating the data across different periods. The first and second teams were organized in 1965 and were directed by Dr. Minamiura, professor emeritus of Sapporo Medical College. The study of preschool period, the most active phase of the longitudinal project, was launched in 1970 under the direction of Professor Miyake, one of the authors of this paper.

SAMPLE

The initial source of potential subjects was 177 pregnant women who voluntarily responded to a questionnaire on pregnancy at the Obstetrics Department of Sapporo Medical College Hospital in 1966. The following are the criteria for singling out the subjects from the women stated above. i) Being a member of a nuclear family, ii) being between 20 and 30 years of age, iii) being a high school or college graduate, iv) being an expectant mother, v) husband being wage and salary earner, vi) being unemployed, vii) living in the city of Sapporo, and viii) being expected to stay in and around Sapporo at least for three years after delivery. Thus 14 expectant mothers were singled out in 1966. By the same procedure we succeeded in obtaining the willing collaboration of 19 expectant mothers in 1967, and 18 in 1968. Thus the total number of the subjects were 51 at the initial stage of the data collection started. Unfortunately Sapporo is a city of floating population and our sample shrank gradually as we followed it up longitudinally. Only 22 mother and child pairs could be followed up continuously for ten years from the beginning of the data collection.

DATA COLLECTION

Interviews The mother was interviewed repeatedly from the period of pregnancy until the child was 8½ years old. During the first three years the interview was conducted every three months, during the preschool years annually, and thereafter once in every three years. The interviews conducted during the first three years covered feeding, sleeping, toileting, bathing, cleanliness, dressing, motility of the child and child reactions to people. At older age periods the area of functioning covered was modified to include topics appropriate to the child's age. At all stages the inquiry was directed toward obtaining a continuing record on health, nervous tendencies, personal and social adjustments, nature of interests and activities, the quantity and quality of parent-child communications as well as the family's daily life.

Prenatal interviews covered, among others, mother's attitude toward pregnancy, plans for infant feeding, anxiety and fears regarding delivery and care of infant-to-be, dependency pattern to husband and husband and wife adaptation. Besides, during the first year, there

was an interview held separately with the mother and father covering her/his family background and life history as well as parental attitudes and practices.

During the preschool years, POT Scale (Japanese version of PARI Scale), Yatabe-Guilford Personality Inventory (Japanese version of Guilford Personality Inventory) and Kraepelin Test of Mental Performance were administered to the mother.

At 8½ years of age, CCP Test (a projective-type test for assessing the child's cognition of his parents) was administered to the child, and at 11½ years of age, the child is to be interviewed for the first time. This interview covers child's interests, activities, peer relationships and parent-child relationships. Ratings and summaries are available from all the interviews stated above.

Behavior Observations Home visits were made four times during the first year, and twice yearly from 1 to 3 years of age. Observations of the child and the mother-child interaction were made. Prose summaries of these observations were prepared.

Based on these summaries plus the descriptions of the child behavior supplied by the mother in the interview, global ratings were made on the behavioral and temperamental characteristics of the child. The three-point rating scales used were related to the following nine characteristics identified by Thomas et al. (12).

(i) the level and extent of motor activity; (ii) the rhythmicity, or degree of regularity of functions such as eating, elimination and the cycle of sleeping and wakefulness; (iii) the response to a new object or person; (iv) the adaptability of behavior to changes in the environment; (v) the threshold, or sensitivity to stimuli; (vi) the intensity, or energy level of responses; (vii) the child's general mood or disposition; (viii) the degree of the child's distractibility from what he is doing; (ix) the span of the child's attention and his persistence in an activity.

As for the mother behavior, ratings were made on such variables as dealing with amount and quality of physical contact, sensitivity and responsiveness to infant, amount of stimulation, acceptance of the child, adequacy in coping with needs of the infant and confidence in maternal role.

Each child was observed in the University experimental nursery school from 3½ to 5½ years of age. The child came once a year to play with children of the same age for 3 half-day sessions. The child's behavior was videotaped and ratings were made on variables dealing with curiosity, aggression, dependency, anxiety, sociality, emotionality, conformity and sensitivity.

Each mother and child pair was observed in the play room of the University laboratory at 3½, 4½ and 5½ years of age of the child. The situation was unstructured in that mother and child were free to do what they liked. A chair and magazines were provided for the mother. Toys were available, so that the child could play and the mother could help or join in if she liked. The mother-child interaction was videotaped and ratings were made on the mother's variables such as directing, helping, giving affection, observing attentively, restricting and structuring as well as on the child's variables stated above. Moreover, verbatim transcripts of the mother-child interaction were prepared from the videotape in order to be unitized into communication units and be coded according to the following categories: statement, question, direction, proposal, explanation, acceptance and negation. The details of the method of unitization and coding are explained elsewhere (10).

Around the 6th birthday of each child, the mother and child were observed in two different situations. The first situation was structured: the child was required to make designs with blocks after models, and the mother was told that she could say anything to her child but could not touch the blocks. The second task was semi-structured in that mother and child were told to play together with a toy consisting of a board with 49 holes arranged in a square pattern and 63 pegs of different colors. If they wished, they could make several patterns with pegs on the board.

Furthermore at 8½ years of age, each mother and child pair was observed in a semi-structured situation: the child was required to build the house with Lego blocks and the mother was told to give "as much or as little verbal help as you like." The mother-child interaction in the structured or semi-structured situations was videotaped and ratings as well as unitization and codings of verbatim transcripts were made.

Child Performance Measures The mothers were required to respond to the Tsumori-Inage Infant Development Questionnaire at frequent intervals from the time of the child's birth until the child was 3 years old. The MCC Baby Test was administered from 12 months to 2½ years at six-month intervals to the children. The Tanaka-Binet Intelligence Test was administered to all the children at 3, 4, 5, 6, and 8½ years of age. The Boenton Visual Memory Test was administered at 3½, 4½ and 5½ years of age. At 8½ years of age, the Matching Familiar Figures Test and the CCP Test were administered.

Medical Examinations Physical check-up of the child was performed by a pediatricist monthly during the first year, and twice yearly from 1 to 3 years of age. The mother's health and physiological conditions during pregnancy, delivery and lying-in periods were checked by obstetricians.

Future Plans We are gathering further information on the 22 mother-child pairs. Mother interview, child interview, observation of the mother-child interaction and the administration of IQ test and personality test to the child are included in the follow-up study to be carried out when the child is 11½ years of age. We hope to continue this longitudinal project until the children come of age.

SUMMARY OF TENTATIVE FINDINGS

Our sample size being not large, we started to analyze our data from the idiosyncratic point of view to see when and under what conditions consistency and change of mother-child relationships took place. Up to now 10 papers have been presented at the annual convention of the Japanese Society of Child Health by the first and second teams, and 8 papers at the annual convention of the Japanese Society of Educational Psychology by the third team.

These presentations, however, were preliminary in nature as the data processing had not been completed yet. It will be at least another year or two before we finish processing the entire data of the first 10 years of the child both metrically and idiosyncratically. The overall summary of the tentative findings from the case study analysis and the hypotheses drawn from this analysis follows.

1. a) Variables of the mother's life history such as her own experience in being mothered, the degree of disruption or family intactness, identification with her parents, interest in and experience with children, and trauma due to ill health and accidents, b) marital situation during pregnancy, and c) mother's adaptation to pregnancy as assessed by her

predominant attitude, anxiety and fear were found to be predictive of maternal adaptation as assessed by acceptance of maternal role, acceptance of the baby, and responsiveness to the baby. Some of the mothers who had difficulty in the early period of undertaking maternal care of their infant had been an unhappy child. Some had experienced trauma due to ill health, and some other had been weakly identified with their mother. In some cases, the marital commitment was unclear and anxiety regarding the marriage was added to anxiety regarding the pregnancy. It may be hypothesized that if, by the time of the first pregnancy, the mother has developed strong personality characteristics of nurturance and has a strong feminine identification, and marital harmony is present, it can be predicted that her predominant mood and her adjustment during pregnancy are likely to be good, and good pregnant adaptation in turn leads her to a satisfactory maternal adaptation.

2. There seems to be a complex interaction between an infant's characteristics and the behavior and characteristics of the mother. In the case of a difficult infant, the mother must cope with his irregularity, irritability, distractability or inactivity. From our analysis, it may be hypothesized that if the mother is aware of her infant's needs and responds adequately and contingently to behavioral expressions of these needs, the infant can be given stimulation appropriate to his state, individual capacities and developmental level. On the contrary, if the mother is inadequate, inconsistent or impatient in her handling of the child, he is likely to react negatively. Among the difficult infants we studied, some became well-adjusted preschoolers and even did well in elementary school, while some others remained as they had been before. It may be hypothesized that whether or not the difficult infant continues to be difficult depends on the way in which care and stimulation are given by the mother.

3. On the basis of the behavioral ratings and the analysis of the verbatim transcripts, attempts were made to classify the mother and child pairs into several different types.

The following are the four types we have tentatively found from among our sample (9).

(i) The mother takes initiative in the flow of the sequential interaction between the mother and child, and both maternal press for the child's achievement and maternal sensitivity to the child are relatively high.

(ii) The mother takes initiative, maternal press for achievement is relatively high, and maternal sensitivity is relatively low.

(iii) The child takes initiative, maternal press for achievement is relatively high and maternal sensitivity is relatively low.

(iv) The child takes initiative, maternal press for achievement is relatively low and maternal sensitivity is moderate or low.

These types were not always stable through the preschool and school age periods. There are some mother and child pairs which remained in a same type through the child's preschool and school age periods. Some others, however, moved from one type to another as time went on, and the child's behavioral characteristics seemed to change correspondingly. From this, one may conclude that the child's behavior is modified by the mother's behavior and undergoes considerable changes over time. It equally seems to be true that the mother's behavior is modified by the child's behavior. If the mother's efforts to press the child's intellectual achievement meet with failure, she may adjust her

expectations and decrease her pressure upon the child.

It is now apparent that if the child's development is to be understood properly, it will not be through continuous assessment of the child and the mother separately, but through continuous assessment of the reciprocal interactions between the two to determine how these interactions facilitate or prevent adaptive integration as both the child and the mother make the journey of life together.

In a longitudinal study of the mother-infant interactions, Clarke-Stewart (2) utilized a statistical analog of the back and forth influences and was able to show a complex reciprocity between the mother and infant.

We also are planning to analyze our longitudinal data on some ten years' mother-child interactions statistically.

4. As mentioned earlier in this paper, around the sixth birthday of the child, the mother and child were observed in two different situations. One was the structured situation in which the child was required to make designs with blocks after several models and the mother was told that she could say anything to her child but could not touch the blocks. The other was the semi-structured situation in which the mother and child were told to play together with a board and pegs and they could make several patterns with pegs on the board if they wished.

The mother-child interactions in each of these two different situations were compared with the interactions in the unstructured free play situation observed at age 5½ (8). We thought that the behavior elicited by the task in the structured situation might not have been typical of either the child's learning or the way in which the mother helps it. The child's behavior was relatively stable through the three situations each of which was structured differently. On the other hand, the mother's behavior in the structured situation was more or less different from that in the semi-structured or the unstructured situation. It is interesting that while some mothers are more involved in the child's activity in the structured situation, some others, on the contrary, increased their interests in the child in the semi-structured or unstructured situation. This fact suggests to us the necessity of observing the mother and child in a variety of situations including both the laboratory situation and the natural situations.

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