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ON THE RELATIONSHIP BETWEEN INFANT TEMPERAMENTAL CHARACTERISTICS AND MATERNAL BEHAVIOR IN THE FIRST THREE MONTHS ¹

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INTRODUCTION

The relationship between a mother and her infant is so complicated that one may indeed question its position as an object of scientific inquiry. The complexity may result from two main factors. One can be traced to the present status of behavioral science in tackling the problem : that is to say, the readiness of researchers in first describing the phenomenon and then in predicting the functional relationship among the component factors in question. In this regard, Hinde (1976) argues that the absence of a descriptive base is in part responsible for the difficulties and failures of researchers in this area of social science.

The other factor is that the mother-infant relationship, like other inter-personal relationships, involves not only overt interactions between the participants, but also the subjective interpretation of the partner's behavior. This, in turn, is the product of mutual subjective evaluation, ad infinitum (e. g. Laing et al., 1966). In other words, an important part of the relationship is based on interpersonal perception which is in itself a very complicated process and which has not so far been dealt with satisfactorily (Swensen, 1973).

However, as a result of the different cognitive levels of the participants, the process of reciprocal interaction between mother and infant has a less symmetrical structure than that between two adult persons. The mother ascribes meaning and intents not only to the infant's behavior but also to her own vis à vis the infant's behavior (Trevarthen, 1974). Thus it is difficult to ascribe such ability to the infant.

As compared with adult inter-personal relationship, the fact that the infant does not

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speak seems to further complicate the problem : without the verbal cues of the infant, the mother's imputation of meaning and interpretation of the behavior of her child seem wholly subjective. The researcher/observer is thus confronted with the problem with something on the borderline between pure imagination and behavior with objective meaning.

In this paper, we would like to emphasize the imaginative or subjective aspect of the mother's perception of the infant and her relationship with the infant in forming a certain kind of mother-child relationship. We will illustrate this by presenting data on the differential effect of the infant's temperamental characteristics on the mother's behavior and with special reference to the infant's sex.

Infant temperament has been the focus of much interest in recent years (Thomas, Chess & Birch, 1970 ; Kagan, 1971). We believe that the infant's temperamental characteristics are qualities that basically do not change very much after birth. In this sense, the infant's temperamental characteristics have their origins in the biological make-up of the organism. However, to argue about whether temperament is innate or learned is as futile as to argue about whether development in the child is a result of nurture or of nature. What we would like to point out in this paper is the fact that as ordinary people, we tend to see a consistent quality in an infant. We believe, in other words, that the infant has a certain temperament.

What is called congruency (Secord & Buckman, 1965) depends very much on the subjective evaluation of the participants and the evaluation of the subjective evaluation and so on. The infant's temperament can be thus considered as possessing the 'self-fulfilling-prophecy quality'. This said, we are not implying that 'everything is in the human imagination'. As ordinary people, we see reality as clearly as it can be seen. We observe the infant's behavior, his face, we listen to his voice. We examine and test our perception of the infant just as we examine and test other realities in our lives. However, this does not deny the importance of the role of our subjectivity which seems to possess objective existence. What seems problematic is how to find out the kind of 'objective' facts of the infant which will lead to this kind of subjective perception and not that kind of subjective perception, and how to specify how this subjective evaluation by the caregiver would in turn affect the relationship between the caregiver and the infant and the infant's development in general.

What follow is a preliminary examination of some of the data gathered so far. We attempt to explore some aspects of individual differences in the infant and its relationship with the mother during the first six months that seem to be leading to different types of social behavior in the child from six months onward to the age of three.

PRELIMINARY LONGITUDINAL STUDY

METHOD

1. *Subjects.*

Thirty-three out-patients in the Department of Gynecology and Obstetrics, Hokkaido University Hospital were selected for the study. In their 32nd week of pregnancy, agreement for cooperation was obtained. Thirty-one of them were invited to take part in the study. Since the delivery of five of the thirty-one subjects was not full-term,

eventually data from twenty-six pairs of mother and child of full-term birth were obtained. They formed the base of our longitudinal study. The following is a description of some aspects of the subjects.

Mothers :

- a) Average age 28.0 yers (range 24 to 35) when first interviewed.
- b) Twenty-four were from nuclear family, two lived together either with the husband's parent or own parent.
- c) Among twenty-three subjects with data on educational background, 14 were high school graduates : 2 were graduates for nursing school ; 4 were graduates of junior college and three were university graduates.
- d) Three of them expect to work after giving birth.
- e) Eight were considered normal delivery, the remaining 18 were not considered normal delivery for one reason or another.

Infants :

- a) Fourteen were males, twelve were females. These infants were full-term.
- b) Apgar scores were above 8 at one minute.
- c) Birthweight averaged 3105 g (range 2120g to 3820g)
- d) One S. F. D; one L.F.D.

2. Procedures.

Although the following procedures were taken for data collection not all of the data are reported in this paper.

- i) *Interviews* : From the 32nd week of pregnancy till the 3rd month after delivery, subjects were interviewed on six occasions : 32nd week, 38th week of pregnancy, 3rd day, 5th day, one month, three months after delivery. Owing to lack of space the details of interviews will not be described here. Suffice to say that they covered a wide range topics judged to be suitable for yielding the necessary data for each stage. The mother's evaluation of own child-rearing experience was elicited and scored.
- ii) *Observations* : Observations of both the mothers and the infant's behavior were made during the lying-in period as well as during home visit interviews. Two observations were carried out during the one week lying-in period (3rd day, A.M. ; 5th day, P.M.). During these observation sessions, each observation unit lasted for 10 seconds. Each session lasted for about 20 minutes. Data of the lying-in period will not be analysed here. Observations during home visits were made by one of the two home visitors during the interview with the mother. The following is a list of the behavioral categories observed (See Moss, 1967). Maternal Behavior : (1) Look at infant, (2) Hold infant, (3) Rock infant, (4) Affectionate contact, (5) Stimulate infant, (6) Talk to infant. Infant Behavior : (1) Awake active, (2) Awake inactive, (3) Total awake, (4) Sleep, (5) Irritable, (6) vocalize, (7) Smile, (8) Mouthing. The observation unit was 30 seconds each.
- iii) *Modified Infant Temperament Questionnaire* : Carey's revised version of Thomas and Chess's Temperament Questionnaire was administered during home visits (i.e. together with 1 month and 3 month interviews). Only selected numbers of items were employed : three for Rhythmicity ; four for Adaptability ; one for Approach ;

five for Intensity and eight for Mood (Carey, 1971).

- iv) *Response to Interruption of Sucking* : Nipple was inserted and infant allowed to suck for 20 seconds and then extracted. VTR recorded the infant's response to the extraction for 60 seconds. Scores were obtained for measuring latency until crying and movement of body and limbs started (see Bell et al., 1971). Two sessions were administered : RIS 1 (3rd day) ; RIS 2 (5th day), five trials for each session. For the present analysis, only the first trial of each session was considered.

RESULTS.

Relationship between infant's temperamental characteristics and two maternal variables:

1. *Infant's temperamental characteristics and mother's evaluation of her own child-rearing experience.*

No significant difference was observed in the infant's temperamental characteristics between one month and three months. Mothers showed consistent tendency in evaluating their own child-rearing experience. Correlations between the infant's temperamental characteristics and the mother's evaluation of her own child-rearing experience are shown in table 1.

As is clear from table 1, significant positive correlation exists between the infant's temperamental characteristics and the mother's positive evaluation of her own child-rearing experience in one month. This is especially clear for male infants ($r=.63$, $p<.05$) while no significant correlation was observed for female infants ($r=.14$). A similar tendency was observed at 3 months. These data seem to suggest that while mothers of "easy-to-manage" male infants tend to evaluate positively their child-management experience it is not true for mothers of female infants.

TABLE 1

Correlations Between Infant Temperamental Characteristics and
Mother's Evaluation of Her Own Child-rearing Experience

Mother's Evaluation of Own Experience	Infant Temperamental Characteristics	
	1 month	3 months
1 month		
total	.52*	.0
male (n=12)	.63*	.11
female (n=12)	.14	.11
3 months		
total	.41 Δ	.34
male (n=11)	.59 Δ	.56 Δ
female (n=11)	.25	.09

* $p < .05$ Δ $p < .1$

Significant negative correlations between the crying measure in RIS 1 and infant temperamental characteristics was obtained for female infants ($r = -.87$, $p < .05$). Furthermore, significant negative correlation was obtained between the mother's evaluation of her own child-management experience at one month and the female infant's crying response measure in RIS 1 ($r = -.72$, $p < .05$). This result suggests that for female infants, those who responded rapidly with crying to RIS were more likely to be judged "easy to manage" and their mothers tended to feel positively toward child-management experience with their infants.

From these data, it seems reasonable to suggest that the infant's temperamental characteristics has differential effects on the mother's evaluation of her own experience with the infant.

2. *Infant's temperamental characteristics and mother's child-management behavior.*

At one month, significant negative correlations were obtained between mother's affectionate contact behavior and the infant's temperamental characteristics for female infants during waking period ($r = -.87$, $p < .05$) and during sleep period ($r = -.57$, $p < .05$). Significant negative correlation was also obtained between the female infant's temperamental characteristics and the mother's tendency to hold the infant when irritable ($r = -.84$, $p < .05$). No significant correlation was observed between infant's temperamental characteristics and any of the mother's behavior at three months.

To look further into the effects of the infant's temperamental characteristics on the mother's behavior, another analysis was carried out. This compared a group of 5 infants who scored high on the temperamental characteristics measures at one month and 3 months, with another group of 5 infants who scored low on the same measures for the same periods. Table 2 shows the difference in mother's behavior between these two groups.

Table 2 indicates that "difficult" infants receive more physical contacts from the mothers. Of course, this can be interpreted as showing that these infants elicit more physical contacts from the mothers.

While no significant correlation was observed at 3 months, it does not imply the absence of temperamental characteristics on maternal behavior.

Differences in maternal behavior were also observed to be correlated with the mother's evaluation of her own child-management experience (table 3).

Thus, those who evaluated their experience with the infants negatively were observed to hold, look and make affectionate contacts more often when the infants were irritable. This suggests that when greater demands were made of the mother by irritable infants, mothers tended to feel negatively about their experience.

DISCUSSION

Some aspects of sex differences have been reported in mother-infant interaction studies (Moss, 1966 ; Bell, 1975). One interpretation is that infants are different from birth. Phillips et al., (1978) have reported the presence of differences between female and male newborns in some spontaneous activities. While these 'innate', objective differences are important and have to be accounted for, the mother's subjective perception of the infant should not be neglected either.

Our results indicate that the temperamental characteristics of the female infants

TABLE 2
Differences in Maternal Behavior Between Two Groups of Infants

Maternal Behavior	t values	
	1 month	3 months
Looks at infant	A	
	S	
	I	
Holds infant	A	- 2.09*
	S	- 1.78
	I	- 4.25**
Rocks infant	A	
	S	-2.16*
	I	
Affectionate contact	A	-10.62***
	S	- 1.72
	I	- 1.91
Stimulates infant	A	
	S	
	I	
Talks to infant	A	
	S	2.07*
	I	

*P<.10 **p<.01 ***p<.005
A=Awake S=Sleep I=Irritation

have a different pattern from that of the male infants in influencing the mother's behavior. We suggest that this indicates that the mother's subjective perception of the infant is different depending on the infant's sex.

RIS is one example that we have tried. It is hoped that more detailed description of the temperamental characteristics of infants will shed light on the relationship between the infant's sex and the differential effects of the temperamental characteristics on the mother.

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TABLE 3

Relationship Between Differences in Maternal Behavior and the
Mother's Own Evaluation of Child-Management Experience

Maternal Behavior	t values	
	1 month	3 months
Looks at infant	A	-8.98**
	S	
	I	
Holds infant	A	2.71 Δ
	S	
	I	
Rocks infant	A	-1.94 Δ
	S	
	I	
Affectionate contact	A	-1.99 Δ
	S	
	I	
Stimulates infant	A	-3.23*
	S	
	I	
Talks to infant	A	
	S	
	I	

Δ p<.10 **p<.05 ***p<.01

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