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DEVELOPMENT OF INFANT DISTRESS AND MATERNAL REGULATION BEHAVIOR OBSERVED AT HOME DURING THE FIRST YEAR

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ABSTRACT

The developmental change in infant distress and maternal regulation behavior during the first year was described based on longitudinal home observation. The length of the infants' distress shortened and became less frequent. Maternal regulation behavior also changed with the child's development. Moreover, individual difference was apparent in infant distress and maternal regulation behavior. These results were argued, based on the perspective that maternal regulation behavior is formed during interaction with their child.

Key Words: infant distress, maternal regulation behavior, longitudinal home observation, developmental change

INTRODUCTION

Factors that affect the development of infant emotion regulation can be divided roughly into two types, namely an infant's own features, such as a temperamental disposition, and environmental agents, such as the caregiver's responses. In addition, much still remains unknown about the details of the developmental process of emotion regulation. However, there is fundamental agreement that it begins from control led by the caregiver, and resulting in the child's own autonomous control at toddlerhood. Therefore, especially in early infancy, when considering emotion regulation, the caregiver's role is thought to be very important.

There has been considerable research that considers the influence of the caregiver, especially the mother, on the development of children's emotion regulation in recent years. For example, some research considers the influence of the mother's various features (Field, 1994; Gottman, Katz, & Hooven, 1997; Molitor, Mayes, & Ward, 2003), and the concrete behavior of maternal emotional reactivity or contingency (Crockenberg, & Leekes, 2004; Denham, Mitchell-Copeland, Strandberg, Auerbach, & Blair, 1997; Nicely, Tamis-LeMonda, Grolnick, 1999). Furthermore, other research examines the style of maternal emotion regulation in mother infant interaction (Calkins, & Johnson, 1998; Grolnick, Kurowski, McMenamy, Rivkin, & Bridges, 1998; Spinrad, Stifter, Donelan-McCall, & Turner, 2004). This research showed that the various features of the mother affected

children's emotion regulation.

However, much of this research treats the mother's factor as a fixed concept, like sensitivity, and there is little research into its developmental change. Further research must be carried out to consider the relation between maternal regulation behavior, and the features of children's development and emotion.

Moreover, the majority of the subjects of the aforementioned research are toddlers, with little research carried out on infants. In order to consider the relation of maternal behavior and children, it may be natural to become interested after the toddler stage, to ensure children's regulations begin to appear more clearly. However, emotion is a relational process. It is necessary to regard not only the children's emotion regulation but maternal behavior, namely, that formed during mother-child interaction. Therefore, in order to consider the influence of the caregiver on the children's emotion regulation, more knowledge must again be acquired about the formation of caregiver's regulatory behavior during emotion communication with their infant.

This report considers the developmental change of infant distress and maternal regulation behavior through longitudinal home observation from one-month-old. Its main purpose is to describe the developmental change of emotion regulation, focusing on maternal behavior.

METHOD

Subjects

4 mother and infant dyads (2 boys and girls, respectively) participated in longitudinal observation from one-month-old. These mothers and infants were part of 26 observation groups. All infants were first born and none had any developmental problems.

Procedure

Home Observation

The same female observer visited the home and carried out observations twice each month, from one month onwards for six months, then once monthly for a further six months. During observation, the interaction of the mother and infant in a natural setting was recorded with a VTR. Although an experimental observation was included in the procedure, it was later excluded from analysis. The entire recording time of each observation was about 90 minutes. In this report, only the scene when the infant became distressed during 50 minutes after the start of observation was analyzed.

Interview

An interview concerning their infant was carried out at the end of each home visit, with two kinds of items used in this report. One was the maternal cognition of the features of infant distress and another was the maternal self-efficacy to control the infant distress. The following two questions were included in the features of the infant distress. "Does your child often cry?", "Does your child cry for a long time?" The following two questions were included in the control. "Can you cope with your infant distress well?", "Can you guess the cause of your infant distress well?" Mothers rated (1=always, 5=never) these four items.

Analysis

Home Observation

The Feature of Infant distress

The number of instances of infant distress seen during a single observation was counted, with the distress time divided into 10 second periods. The length of distress was expressed in terms of the number of such periods.

Maternal Regulation Behavior

Maternal regulation behavior in response to infant distress was analyzed and maternal regulation strategies were classified into the following four types: "sensory stimulation", "holding", "play", and "care-giving". Swaying, knocking, stroking, etc. were included in "sensory stimulation." Holding and supporting infant posture were included in "holding." Presentation of toys, peek-a-boo, etc. were included in "play." Administering breast-feeding or food, a pacifier, etc. were included in "care-giving." Moreover, the frequency at which each strategy was performed during a single period of distress was computed.

Interview

Five stages of response, from "yes" to "no", were converted into a one to five point scale.

RESULTS

1. Developmental Change of Infant Distress

First, the developmental change in the length and frequency of infant distress are shown in Figures 1 and 2. Figure 1 shows the three-monthly average for the length of a single distress.

According to Figure 1, remarkable individual differences are seen in the length of distress over the initial several months. According to the monthly average, the difference at one-month-old is clear. However, it converges quickly and individual differences become almost imperceptible at the end of the first year.

Figure 2 shows the three-monthly average for the frequency of the distress. According to the figure, unlike the length, the frequency of distress decreases greatly on a temporary basis during the period seven to nine-months-old, and then reoccurs increasingly

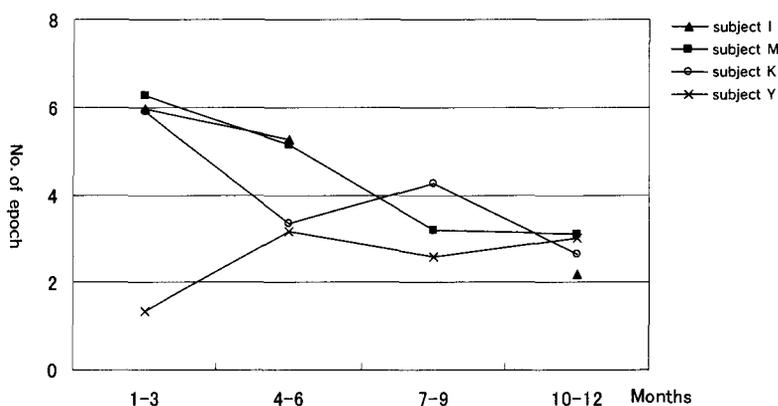


Figure 1 Developmental change of length of distress

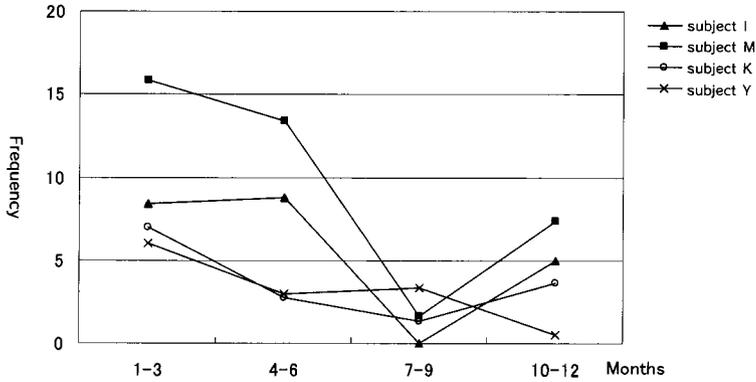


Figure 2 Developmental change of frequency of distress

henceforth. Of our four infant subjects, the frequencies were seen to be higher for cases I and M than for the other two infants (The length of the distress by six-months-old of these two infants was also long compared with the other two, and they were considered to be comparatively difficult infants).

2. Change in Maternal Regulation Behavior

Next, a change of maternal regulation behavior in response to infant distress is shown in Figures 3-6. All figures show the three-monthly average for the frequency of the specific regulation strategy per single period of distress.

Figure 3 shows the result of “sensory stimulation”, which is a strategy used relatively often by mothers for one year. Although there are some variations, all mothers perform this once every two periods of distress. However, except for case K, the frequency decreased considerably during the period seven to nine months.

Figure 4 shows “holding”. According to Figure 4, when the infant is several months old after birth, and when the child became about 1 year old, there are mothers who hardly use holding to calm their children’s distress. When a child becomes about 1 year old, however, mothers can be divided into types that almost always hold their children when they express distress, and those who hardly do so.

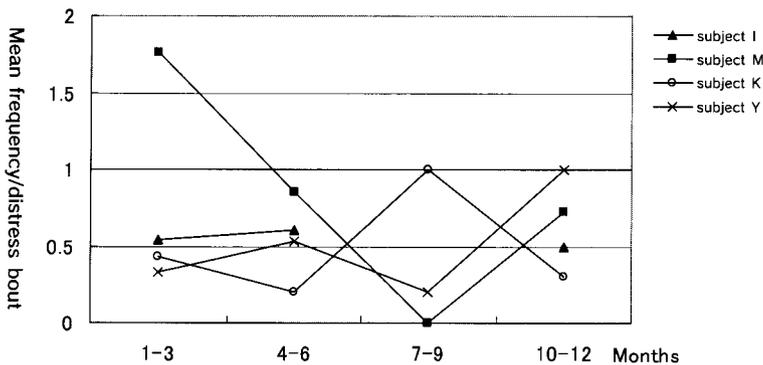


Figure 3 Change of mothers' regulation strategies: a (“sensory stimulations”)

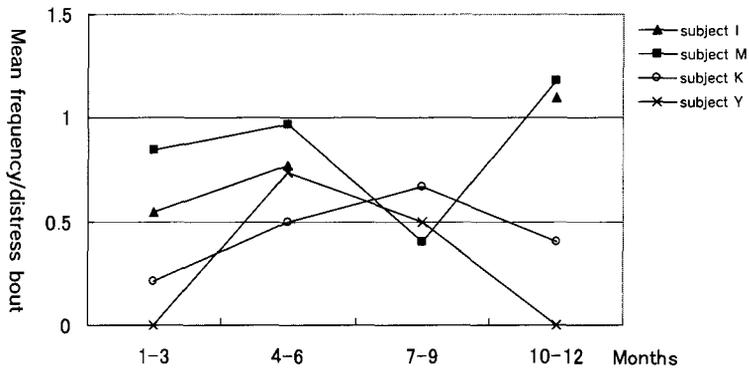


Figure 4 Change of mothers' regulation strategies: b ("holding")

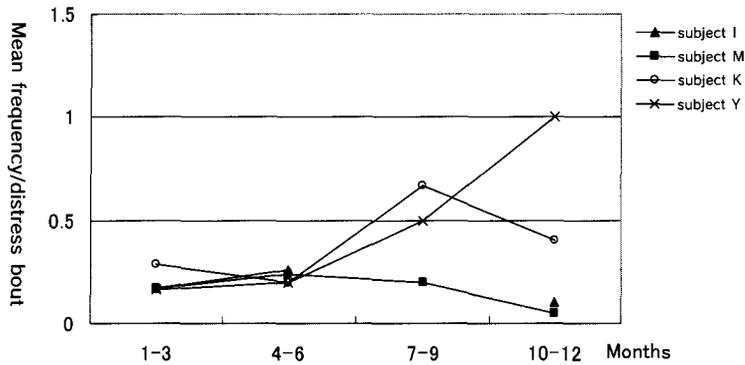


Figure 5 Change of mothers' regulation strategies: c ("care-giving")

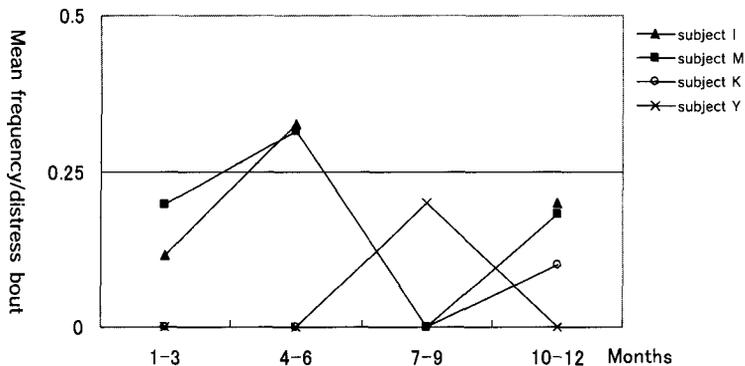


Figure 6 Change of mothers' regulation strategies: d ("play")

Figures 5 and 6 show "care-giving" and "play", both of which occur at low frequency. Moreover, there are individual differences in its selection. Although cases K and Y use a comparatively large amount of "care-giving" strategies after the age of seven months, the other two mothers hardly used them at all. On the contrary, the frequency of "play" of cases K and Y is zero before seven months.

3. Mother's Cognition of Infant Distress and Regulation Behavior

Next, the results of the interview are described. First, the mother's cognition of their infant distress is shown in Figures 7 and 8.

Figure 7 shows the three-monthly average for the response concerning whether her infant cries for a long time. According to the figure, the mothers' replies are mostly consistent over one year, with almost no response stating that the infant had cried for a long time. On the other hand, the cognition of the frequency of infant distress changes over the first year, and individual difference between mothers is apparent (Figure 8). On the whole, responses stating that the infant cries often decrease as the infant grows older.

When these mothers' cognition is compared with the feature of the observed infant distress, consistency is comparatively low. For the first several months, although considerable variations in the length of the observed infant's distress are apparent, there is almost no difference in the mother's cognition. Moreover, the frequency of the observed distress is not consistent with the maternal cognition.

Next, the maternal self-efficacy for controlling the infant's distress is shown in Figure 9, showing the three-monthly average for the response concerning coping with distress.

There are individual differences in the cognition of coping. Cases K and Y always replied very positively through one year, while that of case M was contrastive. When

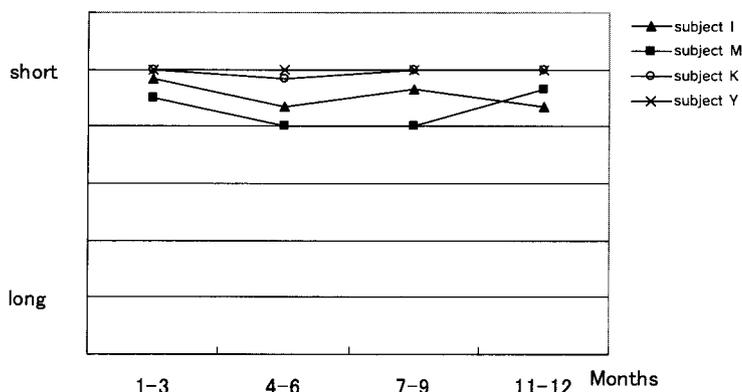


Figure 7 Change of mothers' cognition of distress: a (length)

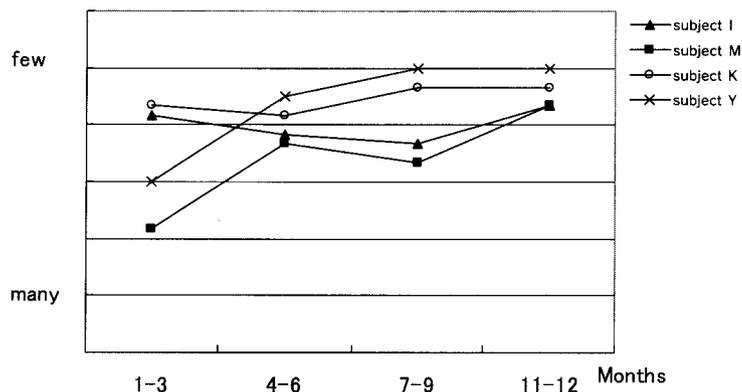


Figure 8 Change of mothers' cognition of distress: b (frequency)

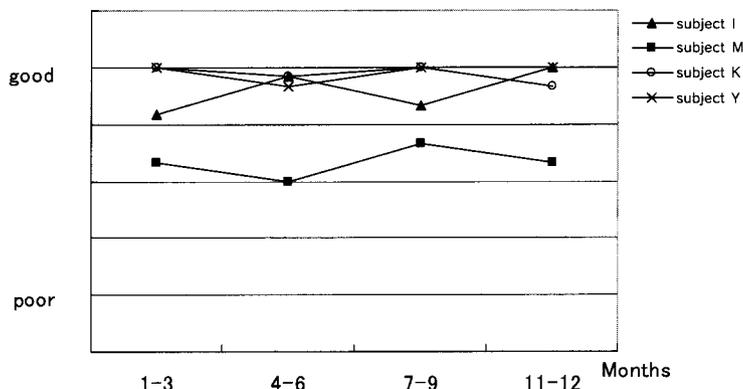


Figure 9 Change of mothers' self-efficacy (coping with distress)

estimating the cause of the infant's distress, virtually identical results to Figure 9 were obtained.

DISCUSSION

First, the developmental change in infant distress during the first year was discussed. As for the length of infant distress observed in the natural home setting, obvious individual differences were apparent for the initial several months. However, one year on, such difference will no longer exist. Moreover, although the frequency of distress involves considerable individual difference for the first six months, it decreases significantly for the period seven to nine months. Furthermore, the subsequent recurrence of individual difference is obvious later. A reduction in the length and frequency of distress is considered to be the basis for the development of emotion regulation of infants and mothers.

It is interesting that the frequencies of distress were seen to decrease considerably during the period seven to nine months, on a temporary basis. When infants become nine-months-old, significant changes occur in the relations between the infant and its environment, hence this is known as a nine month revolution. The regulation of distress may also shift to the following stage through this time.

The primary focus of this report involved describing the change in maternal regulation behavior. All mothers use a comparatively large number of "sensory stimulation" strategies for their intervention in infant distress during the first year. However, age and individual differences are apparent during the selection of other strategies. Generally, in order to calm infant distress, holding is thought to be very effective (Chen, 2005). However, there were mothers who hardly held their infants expressing distress, and the length of these infant's distress was short and their frequency also low. Probably, the mother felt little need to hold their baby, since it was easy to soothe.

It seems that the series of the mother's intervention strategy will become simple as the length of infant distress shortens, if each mother's intervention is examined in detail. In other words, when an infant's distress persists, the mother tries various strategies, without repeating the same regulation behavior. For example, according to the result, mothers of an infant showing a long distress presented "play" as regulation behavior. They were considered to have devised this as a regulation strategy for infants who were hard to

soothe. By one year after the birth, the infant distress shortens, and change in the mother's regulation behavior during a single period of distress will decrease. "Sensory stimulation" strategies are also used during this period. However, the nature of any further, additional behavior differs according to the mother involved. For example, one mother chose to hold her baby, while another opted to give it a pacifier. It is thought that the mother selected effective strategies, based on their previous interaction with their infant.

Especially, in the case of M, the mother was truly diffident and showed no prospects of effective management into the mother infant interaction process at one month. One researcher observing the VTR of this interaction commented that it seemed to indicate the baby leading the mother! However, after several months, the periods of infant distress gradually shortened and became less frequent, whereupon the mother herself could be seen to have prospects and acquire confidence. This is thought to be evidence of developmental change in maternal regulation behavior. All the subjects of this research were first born; hence the mothers had little experiences of coping with infant distress before having a baby. When infants in particular were difficult, the mother had to shape effective regulation strategies during interaction with them.

Consistency was low between the maternal cognition of infant distress or the individual difference in her regulation and the observed result. However, there are seldom many opportunities for a mother to recognize the individual difference of infant distress objectively. If it is based on the position of a mother, the key point is how she feels rather than objectively comparing her infant with other children. The same may be said of regulation behavior. It is thought that during such behavior, the mother's cognition is shaped during interaction with their infant, and affects the interaction with them.

When observed on an overall basis, not only the regulation of infant distress but also maternal regulation behavior developed during the first year. As initially stated, it is thought that a parent leads the emotion regulation during the infant stage. However, the caregiver's regulation behavior itself also changes, based on interaction with her baby. With this in mind, it can be said emotion regulation is performed by both infant and parents during the first year.

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