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| Author(s) | SEKI, Michiko; FURUSAKI, Kazuyo |
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Eating Behavior in the Family and the Development of 4- to 5-year-old Children

Michiko Seki

Hokkaido University

Kazuyo Furusaki

Seishu Juinor College

This is a preliminary study to clarify whether there are any relationships between eating habits in the family and children's mental development. Mothers of 236 4- to 5-year-old children were asked to fill out a questionnaire about eating habits and the Tsumori-Isobe Development Diagnostic Questionnaire.

From the questionnaire about eating habits, the following 7 scales were scored: regularity in eating habits, table manners, table environment and kitchen hygiene, children's eating skills, children's cognitions concerning eating, family role in handing on food culture to the next generation, and mothers' eating habits. As for the children's mental development, developmental quotients on the following 5 factors were calculated: Motor skills, Exploration, Social skills, Daily habits, and Language ability.

We found that eating behavior and environment related to the children's language ability and exploration. These data suggest that mothers' attitudes towards eating habits could be one good index of how they support their children's development psychologically.

Key words: eating habits; eating environment; language ability; exploration

It has been pointed out that Japanese life style has been changed by the increasing number of fast food chains industry, the spread of processed food, and the use of home delivery of already prepared foods (Saito 1980). Such simplification of eating habits may have some influence not only on children's physical development but also on their mental development.

Although there are many studies on the relationship between nutrient substances and children's physical development or health from a nutritional viewpoint (e.g. Ando 1983), few studies have demonstrated psychological effects of the changing circumstances of eating on child development. This is a preliminary study to explore whether there are any relationships between eating behavior in the family and children's mental development.

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Requests for reprints should be sent to Michiko Seki, Research and Clinical Center for Child Development, Faculty of Education, Hokkaido University, Sapporo 060, Japan.

Method

Subjects

Mothers of 236 4- to 5-year-old children (114 boys and 122 girls, 4:5~5:10; $M = 5.05$ years of age) who were enrolled in day care centers or kindergartens in Sapporo City and Tomakomai City in Hokkaido, Japan.

Background of the Subjects: Mothers' average age: 33.0 years of age (range 24 to 46 years of age), Average number of family members: 4.3, Average number of children in a household: 2.1, Number of households which have grandmother: 17, Nuclear family: 85.2%, Working mothers: 76 (32.2%), Non-working mothers: 162 (67.8%)

Procedures

The mothers were asked to fill out a questionnaire about eating habits and the Tsumori-Isobe Development Diagnostic Questionnaire (1965).

The two sets of questionnaires were distributed to the mothers and collected by the teachers of 3 day care centers and 4 kindergartens from October, 1985 to February, 1986.

The Questionnaire about Eating Habits

From the questionnaire about eating habits, the following 7 a-priori scales were scored. The contents of 7 scales concerning eating habits were as follows.

- I Regularity in eating habits: whether or not the child takes 3 meals a day, takes each meal at a regular time, and eats a regular amount of food.
- II Table manners: hand-washing before or after the meal, posture and other behavior during the meal.
- III Table environment and kitchen hygiene: physical environment around the table, the social atmosphere at the table, kitchen hygiene, mothers' concern for food additives and so on.
- IV Children's eating skills: whether or not children can manage a spoon and chopsticks correctly without spilling.
- V Children's cognitions concerning eating: children's cognition about tastes, shapes or names of foods, and mothers' beliefs about children's cognitive development through eating.
- VI Family role in handing on food culture to the next generation: mothers' effort to hand on Japanese culture through eating customs.
- VII Mothers' eating habits: whether mothers eat nutritionally balanced foods or not. Each scale consists of ten different items (see appendix).

The Tsumori-Isobe Development Diagnostic Questionnaire (for children from 3 to 7 years of age)

In order to evaluate children's developmental status, the Tsumori-Isobe Development Diagnostic Questionnaire (for children from 3 to 7 years of age) was administered to the mothers. The development of the scales in this questionnaire was based on 3 years' observation of children's behavioral change at the kindergarten attached to the Ochanomizu Women's College in Tokyo. From records of about 1,000 episodes, Tsumori and Isobe selected 229 behavioral items: Motor skills... 32 items, Exploration... 52 items,

Social skills... 67 items, Daily habits... 29 items, and Language ability... 49 items. The first version of the Tsumori-Isobe Developmental Diagnostic Scales was administered to mothers of 1,205 2- to 7-year-old children. Using data obtained from these samples, a new selection of items was made for the present version of the Scales: Motor skills... 30 items, Exploration... 45 items, Social skills... 45 items, Daily habits... 31 items, and Language ability... 42 items.

Results

Eating Habits and Eating Behavior in the Family

The means and standard deviations for the 7 scales on eating habits and eating behavior are shown in Table 1. The results were analyzed as follows: the subjects were asked to select one out of 3 choices for each item. Each item was assigned 2 points when the answer was desirable for the child development, 1 point when to some extent desirable, and 0 points when undesirable. Therefore, the maximum scores for each scale are 20.

The mean score on the scale "regularity in eating habits" are very high compared with that of "table environment and kitchen hygiene" and that of "family role in handing on food culture to the next generation".

TABLE 1
Means and Standard Deviations for Each Scale of Eating Habits

| Scales on Eating Habits | M* | SD |
|--|------|------|
| I Regularity in eating habits | 18.6 | 1.75 |
| II Table manners | 13.8 | 2.52 |
| III Table environment and kitchen hygiene | 12.3 | 2.39 |
| IV Children's eating skills | 14.5 | 2.87 |
| V Children's cognitions concerning eating | 14.0 | 2.77 |
| VI Family role in handing on food culture to the next generation | 12.6 | 2.53 |
| VII Mothers' eating habits | 14.3 | 2.66 |

*The maximum score for each scale is 20 points.

Developmental Quotients According to the Tsumori-Isobe Development Diagnostic Scales

Means and standard deviations for each developmental quotient are shown in Table 2. The mean developmental quotient for "Exploration" was about 10 points lower than the other quotients.

TABLE 2
Mean and Standard Deviation for each Developmental Quotient from the Tsumori-Isobe Development Diagnostic Scales

| Factors | M | SD |
|------------------|-------|------|
| Motor skills | 113.7 | 14.0 |
| Exploration | 103.9 | 17.3 |
| Social skills | 112.6 | 17.7 |
| Daily habits | 114.7 | 16.9 |
| Language ability | 113.0 | 11.7 |

Correlations between the 7 Scales on Eating Habits and the Tsumori-Isobe D. Q. s

The correlation matrix for the 7 Scales on Eating Habits and the Tsumori-Isobe D. Q. s is shown in Table 3. Most correlations were not very high, but the following significant correlations ($p < .001$) were found between eating habits and children's mental developmental quotients: 1. Table manners and Daily habits 2. Table manners and Language ability 3. Table environment and Exploration 4. Table environment and Language ability 5. Children's eating skills and Daily habits 6. Children's cognitions concerning eating and Exploration 7. Family role in handing on food culture and Exploration 8. Family role in handing on food culture and Language ability 9. Mothers' eating habits and Exploration.

TABLE 3
Correlations Between 7 Scales on Eating Habits and 5 Tsumori-Isobe D. Q. s

| | Regularity | Manners | Environment | Skills | cognitions | Food Culture | Mother's Eating Habits |
|------------------|------------|---------|-------------|--------|------------|--------------|------------------------|
| Motor skills | -.04 | .15* | .18** | .13* | .17** | .17** | .13* |
| Exploration | .03 | .16** | .24*** | .21** | .25*** | .26*** | .28*** |
| Social skills | .03 | .15* | .19** | .20** | .20** | .21** | .19** |
| Daily habits | .03 | .30*** | .25** | .31*** | .20** | .21** | .13 |
| Language ability | .12 | .23*** | .24*** | .18** | .16** | .23*** | .18** |

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Discussion

Among the 7 scales concerning eating habits, 4 scales (I, II, IV, and V) tap children's behavior concerning eating, 2 scales (III and VI) tap mothers' attitudes toward the children's behavior concerning eating, and one (VII) concerns mothers' own eating habits. Regarding children's behavior concerning eating, we found very high scores for Regularity in eating habits. That is, most of the children eat a regular amount of breakfast, lunch, and supper at a regular time. But, we found relatively low scores for table manners. For example, 53% of children always or sometimes stand up or lie down while eating. The scales concerning mothers' attitudes, Table environment and kitchen hygiene and Family role in handing on food culture to the next generation, show lower scores than rest of the the scales. This suggests that mothers do not make the most of the table setting in order to facilitate communication within the family members and they make less effort to hand on Japanese culture through eating life. Only 90 families out of 236 (38%) eat breakfast with all the family members, and only 79 (33.5%) eat supper together. Fathers are so busy working that 22.5% of the families eat supper together only once or twice a month.

Adachi et al. are anxious that a number of fifth grade children whom they studied eat alone in their family (1983). They asked the students to draw a picture about breakfast, asking what they ate and with whom they had breakfast on that day. More than 40% of 1067 children ate breakfast without adults (18% of them ate breakfast alone). They drew very sad looking self-portraits compared to those children who ate with all family members; some of them did not draw their mouths, eyes, or noses.

In the Tsumori-Isobe Diagnostic Questionnaire, Exploration showed the lowest

score. Exploration consists of 45 items which include outdoor activities such as "plays with sand", "catches insects", and "collects nuts". It is often said that urbanization prevent children from outdoor activities. As we have not examined each item of Exploration in this study yet, we can not conclude the lower score on Exploration is due to the lack of outdoor activities, but we think that mothers' consciousness and preparation for the children's play environment has crucial meaning for the children's exploration.

Although no relationships were found between Regularity in eating habits and D. Q. s of 4- to 5-year-old children, perhaps some relationships would be found if much older children were examined (Adachi et al. 1983). Significant correlations were found between Table manners and Daily habits, Children's eating skills and Daily habits, and also between Table manners and Language ability. Table manners, Children's eating skills, and Daily habits are related to home discipline and the relationship between them had been predicted, but not the relation between Table manners and Language ability. Mothers' verbalization of children's behavior through disciplining may affect children's language ability, or children's language ability affect their self-control. Both of the scales on mothers' attitudes toward the children's behavior concerning eating, Table environment and Family role in handing on food culture to the next generation related to Exploration and Language ability. Miyake et. al. (1978) tape-recorded 16 cases of 20 minutes' verbal interchange among father, mother, and child during supper and found that there were 4 types in terms of proportion of verbalization: mother dominant (M type), mother leads (M-F type), father leads (F-M type), and father dominant (F type). F type conversations were found to be focussed less exclusively on the meal, and to be richer in terms of topics than M type, and children in F type families took much more initiative in starting conversations. These observational findings may partially illustrate the relationships between environmental factors and children's exploration or language ability. But, we need some more variables in order to clarify the relationships between them.

Conclusion

We found several relationships between eating habits in the family and children's mental development. It is worthy of special mention that children's exploration and language ability have much to do with the scales on eating behavior. We cannot say that eating habits directly affect children's exploration and language ability from our data. In order to explain those relationships, more detailed observational study is needed. But, these data show that mothers' attitude towards eating habits in family could be one index of how they support their children's development psychologically.

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Appendix Questionnaire about Eating Habits.

I Regularity in eating habits

- ① Does your child eat breakfast every morning?
always, sometimes, seldom
- ② Does your child eat breakfast at a regular time?
always, sometimes not, irregularly
- ③ Does your child eat a regular amount of breakfast?
always, sometimes not, irregularly
- ④ Does your child eat lunch every day?
always, sometimes, seldom
- ⑤ Does your child eat lunch at a regular time?
always, sometimes not, irregularly
- ⑥ Does your child eat a regular amount of lunch?
always, sometimes not, irregularly
- ⑦ Does your child eat supper every day?
always, sometimes, seldom
- ⑧ Does your child eat supper at a regular time?
always, sometimes not, irregularly
- ⑨ Does your child eat a regular amount of supper?
always, sometimes not, irregularly
- ⑩ Does your child eat snacks regularly?
always, sometimes, seldom

II Table manners

- ① Does your child wash his/her hands before meals?
always, sometimes, seldom
- ② Does your child say "Itadakimasu" (Grace) before meals?
always, sometimes, seldom
- ③ Does your child say "Gochiso-sama" (Thanks) after meals?
always, sometimes not, seldom
- ④ Does your child wait quietly for the meal to be served?
always, sometimes not, seldom
- ⑤ Does your child finish his/her meal within 30 minutes?
always, sometimes not, seldom
- ⑥ Does your child stand up or lie down while eating?
seldom, sometimes, always
- ⑦ Does your child eat with good posture?
always, sometimes, seldom
- ⑧ Does your child clean his/her face and hands after meals?

always, sometimes, seldom

- ⑨ Does your child help clear the table?
always, sometimes, seldom
- ⑩ Does your child rest after eating meals?
always, sometimes, seldom

III Table environment and kitchen hygiene

- ① Do you watch television while eating meals?
seldom, sometimes, always
- ② Do you decorate the table with flowers?
always, sometimes, seldom
- ③ Do you use suitable dishes for the types of food being served?
always, sometimes, seldom
- ④ Do you arrange the food carefully or pay attention to the coloring of a dish?
always, sometimes, seldom
- ⑤ Do you make an effort not to scold your child while eating?
always, sometimes, seldom
- ⑥ Do you talk happily with your child while eating?
always, almost always, never
- ⑦ Do you always keep the dining room and the kitchen clean?
always, sometimes, seldom
- ⑧ Are you concerned about food additives?
always, sometimes, seldom
- ⑨ Do you eat leftovers the next day?
seldom, sometimes, always
- ⑩ Does your child look content after eating?
usually, sometimes not, seldom

IV Children's eating skills

- ① Can your child use a spoon with one hand and a cup the other at the same time?
yes..well, yes..not well, can't really
- ② Can your child use chopsticks correctly?
yes..well, yes..not well, can't really
- ③ Can your child use chopsticks with one hand and a cup with the other at the same time?
yes..well, yes..not well, can't really
- ④ Can your child eat miso soup without spilling?
usually, almost always, seldom
- ⑤ Does your child finish his/her meal within 30 minutes?
usually, about 1 hour, longer than 1 hour
- ⑥ Does your child eat rice without spilling?
usually, sometimes not, seldom
- ⑦ Does your child chew his/her food well?
usually, seldom, never

- ⑧ Does your child eat all of his/her meal?
usually, sometimes not, always leaves
- ⑨ Does your child eat anything served without stating likes or dislikes?
usually, sometimes not, does not eat what he/she dislikes
- ⑩ Can your child remove fish bones with chopsticks?
yes...well, yes...not well, can't really

V Children's cognitions concerning eating

- ① What does your child do when a new food is served?
eats curiously, eats when an adult eats, never eats
- ② Does your child pay attention so as not to get burned when a very hot meal is served?
usually, sometimes not, seldom
- ③ Does your child eat spontaneously?
usually, sometimes not, seldom
- ④ Does your child eat by himself/herself?
usually, sometimes not, seldom
- ⑤ Do you teach your child foods' names?
usually, sometimes, seldom
- ⑥ Do you tell your child where food come from?
usually, sometimes, seldom
- ⑦ Do you make your child taste food?
usually, sometimes, seldom
- ⑧ Does your child distinguish many different tastes?
usually, sometimes, doesn't care
- ⑨ Does your child have a clear preference for foods?
usually, sometimes, doesn't care
- ⑩ Dose your child distinguish delicious food from poor food?
usually, sometimes, doesn't care

VI Family role in handing on food culture to the next generation

- ① Does your family eat breakfast together?
everyone, with part of its members, children alone
- ② How many times does your family eat supper together?
every evening, half evenings a week, one or two evenings a month
- ③ How long does it take to finish supper in your family?
40~50 minutes, 20~30 minutes, 5~10 minutes
- ④ Does your child look forward to having meals?
always, almost always, doesn't care
- ⑤ Does your child like canned food or instant food?
seldom, sometimes, always
- ⑥ Do you always cook from scratch?
always, half handmade/half instant goods, only use precooked food
- ⑦ Do you make homemade cookies or snacks?
usually, half homemade and half prepared goods, prepared goods only

- ⑧ Do you often say “ It is a waste to leave food ” to your child ?
always, sometimes, seldom
- ⑨ Do you often tell your child that he/she must be thankful for having enough to eat ?
always, sometimes, seldom
- ⑩ Do you cook traditional food for Japanese annual events ?
always, sometimes, seldom

VII Mothers' eating habits

- ① Do you always eat your fill ?
usually only eat 80% fill, sometimes, always
- ② Do you think about nutritional balance when you eat ?
always, sometimes, seldom
- ③ Do you often go without a meal ?
once a day, once or twice a week, seldom
- ④ Do you eat a lot of vegetables ?
three times a day, once a day, seldom
- ⑤ Do you eat yellow or green vegetables like carrots or spinach ?
three times a day, once a day, seldom
- ⑥ Do you eat fruits every day ?
three times a day, once a day, seldom
- ⑦ Do you eat food which is rich in protein at every meal ?
three times a day, once a day, seldom
- ⑧ Do you drink milk every day ?
once a day, once or twice a week, seldom
- ⑨ How often do you eat dishes cooked with oil ?
once a day, once or twice a week, seldom
- ⑩ Do you eat a lot of seaweed such as tangles, wakame, and/or laver.
once a day, once or twice a week, seldom