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Children's Positive and Negative Emotionality Depending on Their Eating Behaviors

This study investigated childhood eating behavior, the influence of eating behavior on the positive and negative emotionality of children, and the pattern of eating behavior influence on emotionality depending on the age and gender of children. A total of 202 children (ages 5 to 7) were selected from 3 nurseries and 1 kindergarten in Seoul and the survey data responses from teachers were analyzed. The results were as follows. First, children with higher levels of eating behavior showed a higher positive emotionality score compared to those with lower levels of eating behavior. The effect of gender was not significant and positive emotionality tended to increase in the 5 and 6 year old groups as the level of eating behavior increased; in addition, it was generally similar in the 7 year old group. Second, the children with lower levels of eating behavior showed a higher negative emotionality score compared to those with higher levels of eating behavior. The main effects by age and gender were insignificant; however, the interaction of age and eating behavior affected the negative emotionality of children. The eating behavior of children affects emotionality and children with better eating behaviors showed more positive emotional responses and less negative emotional responses in the same circumstances.

Good nutrition during childhood can be influenced by eating behavior. Eating behavior is food preference and food habits in the attitudes shown before, during, and after eating food. The acquisition of proper eating behavior becomes the basis of child behavioral development and improper behavior during mealtimes hinders normal behavioral development that develops into nutritional problems manifested in the behavioral disorders of children. The incidence of eating behavior problems derived from the developmental process of eating behavior is very high and is reported to be connected to problematic behaviors in 1 of every 3 children (Kim, 2002). Proper eating behavior is particularly important during childhood. Childhood is a period of continuous physical growth and development that represents an important cognitive, social, and emotional period; in addition, it is also a period of increasing physical activity and brain development. Sufficient nutrition during this period is essential and influences lifelong development (Lee, Chung, Hwang, Kim, Sung, and Kwon, 2009).

Eating behavior is considered as a standard for understanding the overall developmental condition of an individual. If eating behavior problems exist or an adequate nutrition supply is not properly provided, children are often irritated or distracted, become languid, and are more susceptible to diseases. A child who is unable to maintain the optimal health

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condition due to nutrition deficiency can be disrupted in personal and social development (Nam, 2003). Nevertheless, there exists interest only on food behavior itself and there's few research empirically examining whether food behavior can influence children's development or it can be influenced by children's development.

Recently a variety of variables affecting eating behavior from the developmental aspect have been considered. Eating behavior is dietary life related behavior among individual behavior patterns established through the influences of internal and external environmental factors surrounding a child (Jeong, 2005). The influence of parents or teachers has been largely studied (Min, 2009; Park, 2008; Pelchat & Pliner, 1986) because childhood eating behavior is significantly influenced by parents and teachers. Several studies serve as examples on the influence of parental food habits on the eating behavior of children (Park, 2008), the influence of the mother's nutrition knowledge on childhood eating behavior (particularly the relationship between food habits and food attitudes) (Min, 2009), and on the relationship between the nutritional behavior and knowledge of teachers related to the food habits and food attitudes of children (Pelchat & Pliner, 1986).

Several studies on the influence of the psychological and emotional variables of children and behavioral variables on eating behavior have been conducted. Children with particular eating behavior are difficult for parents or nursery teachers during meal training, which tends to be caught in a vicious circle. Some studies on the relationship between picky-eating infants and their temperament showed that mother's meal training or response should be different depending on temperament (Carruth *et al.*, 1998; Marchi & Cohen, 2009; Pelchat & Pliner, 1986; Reau *et al.*, 1996) and that a child with fastidious eating habit had more activities, irregular eating amounts, and frequency, lower accessibility to foods, and was distracted during meal times (Kim *et al.*, 2005). One study (Kim *et al.*, 2006) showed that the temperament of an infant, eating behavior, mother's food behavior, and meal training method can influence infant's eating behavior quality.

The interests on the influence of eating behavior on the development of children have been explored beyond the investigation of individual external variables that influences the eating behavior of children. Some studies reported that eating behavior affects social ability and hyperactivity (Ohm, 2003). A better eating behavior of a child was resulted in higher leadership abilities and emotional capability and lower hyperactivity and instability. Also, the higher the eating behavior score was, the lower the score for attention deficit and hyperactivity became. These results support the study results that nutritional factors such as dietary habit, food preference, and intake frequency affect physical development, psychological development, and the behavior of a child (Kim & Shim, 1995); however, the causal relationship was not directly studied. Most studies have recognized the importance of factors related to eating behavior; however, few studies examined detailed areas in the context of development (Kwon & Lee, 2004).

It is meaningful to consider not only various factors affecting eating behavior but also the influences of eating behavior on the development of children when considering the nature of development in which each developmental area interacts with one another. The establishment of good eating behavior during childhood can positively influence the overall development of a child beyond the simple formation of good and basic habits.

In this study, we were interested in the emotionality of children. Emotionality is the basic emotional condition that a child has; it is divided into positive emotionality and negative emotionality. Positive emotionality includes happiness or pleasure, and negative emotionality includes sadness, anger, and fear (Sung, 2006). Eating behavior is not established in a short period of time. It is a consistent behavioral pattern continuously repeated and emotionality (an emotional aspect of temperament) can be established during the process of developing long-term behavioral patterns. If food behavior is successfully established, a child experiences pleasure and happiness during the process of establishing eating behavior, which leads to the development of positive emotionality. On the other hand, if eating

behavior continuously fails or is frustrated during its establishment, a child can continuously experience emotions such as frustration, anger, and sadness, which consequently can influence the development of negative emotionality; however, no studies have actually demonstrated and verified this.

This study was conducted to establish the following study problems to investigate the relation between eating behavior and childhood emotionality.

1. Is a child's positive emotionality different depending on a child's eating behavior?
 - 1-1. The effect of a child's eating behavior on positive emotionality will be different depending on the age and gender of a child.
2. Is a child's negative emotionality different depending on a child's eating behavior?
 - 2-1. The effect of a child's eating behavior on negative emotionality will be different depending on the age and gender of a child.

SUBJECTS AND METHODS

Subject

In this study, 183 children aged 5, 6, and 7 years that attended 3 nurseries and 1 kindergarten located in Seoul were selected to investigate emotionality and a child's food behavior. The reason for selecting 5, 6, and 7-year-old children was because basic habits are formed at this period and children can eat by themselves and food preferences are clearly made. In addition, consistent food behavior can be formed through regular and independent snack or mealtimes at nurseries or kindergartens. The general characteristics of the subjects are shown in Table 1.

The subjects were 5 years (39.3%) and 6 years (43.7%); in addition, some 7 year (16.9%) old children were included. The reason for including 7-year-old children was that the search period was conducted in February and some children in the 6-year-old class became 7 years old at the time of implementing this study. The gender distribution showed 53.0% of boys and 47.0% of girls, with a relatively even distribution.

Table 1. General Characteristics of the Subjects

Variables	Frequencies	%	
Child's Age	5 Years-old	72	39.3
	6 Years-old	80	43.7
	7 Years-old	31	16.9
Child's Gender	Boy	97	53.0
	Girl	86	47.0
Mother's Occupancy	Yes	98	53.6
	No	85	46.4
Family Size	3	46	25.1
	4	116	63.4
	5	14	7.7
	More than 6	7	3.7
Father's Age	30-34	10	5.5
	35-39	80	43.7
	40-44	73	39.9
	More than 45	20	10.9
Mother's Age	Less than 30	1	.5
	30-34	36	19.8
	35-39	109	59.9
	40-44	30	16.5
	More than 45	6	3.3

Research Tools

Childhood eating behavior A childhood eating behavior questionnaire developed in a previous study (Kim, 200) was used in this study for the analysis of childhood eating behavior. This questionnaire included 25 items covering childhood food attitudes (e.g., 'The child likes to eat' or 'The child is interested in eating') and eating behaviors (e.g., 'The child takes a longer time in eating' or 'The child likes to eat rice'). Teachers rated the eating behavior of children on a 5-point rating scale with points ranging from 1 (not very true) to 5 (very true). High scores reflect better eating behaviors. The internal reliability of the scale was also good (Cronbach's alpha=.72). The children were divided into 3 groups considering the mean and standard deviation for the analysis of variance. The lower group included 57 children (Mean=1.61, SD=.21), the medium group included 63 children (Mean=2.23, SD=.21), and the high group included 60 children (Mean=3.01, SD=.38)

Child's emotionality Some question items of Child Behavior Questionnaires (CBQ) developed by Rothbart, Ahadi, and Hershey (1994) for the measurement of childhood emotionality were used. Question items related to emotionality in the sub-criteria of CBQ were modified and supplemented with a consideration of the age of the study subjects and the cultural characteristics of Korea in the establishment of an 18-question negative emotionality test tool and a 6-question positive emotionality test tool. Positive emotionality includes the emotion of pleasure (for example, a child smiles at the person they like), and negative emotionality includes the emotion of sadness (for example, a child becomes very frustrated when something is not working), fear (for example, a child is afraid of height), and anger (for example, a child gets angry when forbidden to do something). Each area was represented by 6 questions, to create a total of 24 questions, which was scored by a 5-point scale ranging from 'very disagreed (1 point)' to 'very agreed (5 points)'; the higher the score then the higher the level of emotionality. The child's emotionality test was measured by class teachers of the nursery or kindergarten who filled out the survey questions for the emotionality test. The reliability of the tools for the emotionality test was measured using Cronbach's ; the Cronbach's value of positive emotionality questions was .84 and that of negative emotionality questions were .78.

Study Procedures & Data Analysis

In this study, a survey questionnaire was constructed and used to assess the eating behavior and emotionality of children. For the distribution of the survey questionnaire, the investigator visited the nursery and kindergartens to distribute 200 copies of survey questionnaire for individual children to class teachers. The study period was decided as February because the end of the semester was thought appropriate since consistent eating behavior has been established through at least one year of regular meal and snack time at the nursery or kindergarten. In addition, the teachers that evaluated the emotionality and eating behavior of children were well qualified by the end of the semester.

The questionnaire distributed to class teachers

Table 2. Mean and Standard Deviation of Positive Emotionality of Children by Gender, Age, and Eating Behavior

Gender	Age	Eating Behavior	Positive Emotionality		
			N	Mean	SD
Boy	5 Years-old	Low	18	3.21	.53
		Medium	10	3.42	.51
		High	9	3.83	.71
		Total	37	3.42	.61
	6 Years-old	Low	11	4.06	.61
		Medium	16	3.96	.52
		High	14	4.26	.68
		Total	41	4.09	.60
	7 Years-old	Low	4	4.25	.62
		Medium	5	3.87	.52
		High	9	4.20	.85
		Total	18	4.12	.70
Total	Low	33	3.62	.71	
	Medium	31	3.77	.56	
	High	32	4.12	.74	
	Total	96	3.84	.70	
Girl	5 Years-old	Low	16	3.35	.83
		Medium	12	3.76	.84
		High	6	3.94	.70
		Total	34	3.60	.83
	6 Years-old	Low	5	2.90	.52
		Medium	15	3.88	.50
		High	18	4.11	.59
		Total	38	3.86	.66
	7 Years-old	Low	3	4.61	.25
		Medium	5	3.97	.84
		High	4	3.88	.44
		Total	12	4.10	.65
Total	Low	24	3.42	.87	
	Medium	32	3.85	.68	
	High	28	4.04	.58	
	Total	84	3.79	.74	
Total	5 Years-old	Low	34	3.28	.68
		Medium	22	3.61	.72
		High	15	3.88	.68
		Total	71	3.51	.72
	6 Years-old	Low	16	3.70	.79
		Medium	31	3.92	.50
		High	32	4.18	.62
		Total	79	3.98	.64
	7 Years-old	Low	7	4.40	.50
		Medium	10	3.92	.66
		High	13	4.10	.74
		Total	30	4.11	.67
Total	Low	57	3.54	.78	
	Medium	63	3.81	.62	
	High	60	4.09	.67	
	Total	180	3.81	.72	

was collected after 1 week, with a response rate of 185 copies out of 200. Collected data were analyzed using SPSS 12.0 program and frequency, percentage, and the GLM were used for statistical methods. The GLM can be tested if each cell in the model contains different number of cases as well as same number of cases and provides the same information and function as ANOVA.

RESULTS

Eating Behavior and Positive emotionality of Children

A 3-way GLM univariate of gender (2) x age (3) x eating behavior (3) was performed with gender, age, and eating behavior as independent variables and positive emotionality as a dependent variable in order to examine the influence of childhood eating behavior on positive emotionality and the changes of the effects of eating behavior on positive emotionality by the gender and age of children.

Table 2 shows that the total mean of the positive emotionality score was 3.84 in boys and 3.79 in girls. By age, the total mean of positive emotionality was 3.51 for 5-year-olds, 3.98 for 6-year-olds years, and 4.11 for 7-year-olds. This showed a reciprocal increase of positive emotionality to age. For this situation of eating behavior, the positive emotionality score was, 3.54 in the group with low level eating behavior, 3.81 in the group with a medium level of eating behavior, and 4.09 in the group with a high level of eating behavior. These results showed a

reciprocally higher positive emotionality as the level of eating behavior increases. To evaluate the significance of such differences and the interaction among independent variables, the 3-way ANOVA was performed with its results shown in Table 3.

The main effects were as follows. The positive emotionality of children was significantly different depending on the age of children ($F=7.14, P<.01$). The older group showed higher scores of positive emotionality compared to the younger group. In addition, the positive emotionality of children was significantly different depending on the eating behavior of children ($F=2.66, P<.10$). The group with the higher eating behavior score showed higher positive emotionality compared to the group with the lower eating behavior score. The interaction of gender and age affected the positive emotionality of children ($F=4.45, P<.05$); addition, the interaction of age and eating behavior affected positive emotionality of children ($F=2.52, P<.05$).

A Scheffe test was performed to confirm the presence of significant differences between groups by age or eating behavior with the main influences and the results are presented in Table 4. For age, there were significant differences in positive emotionality between 5 year-olds ($M=3.51, SD=.72$) and 6 year-olds ($M=3.98, SD=.64$) and between 5 year-olds ($M=3.51, SD=.72$) and 7 year-olds ($M=4.11, SD=.67$). For eating behavior, there was a significant difference in positive emotionality between the lower group ($M=3.54, SD=.78$) and the higher group ($M=4.09, SD=.67$).

Table 3. 3-way ANOVA of Positive Emotionality of Children by Age, Gender, and Eating Behavior

	Source	SS	df	MS	F
	Gender	.18	1	.18	.42
	Age	5.95	2	2.98	7.14**
	Eating Behavior	2.23	2	1.11	2.66+
	Gender×Age	3.71	2	1.86	4.45*
Positive Emotionality	Gender×Eating Behavior	.70	2	.348	.84
	Age×Eating Behavior	4.20	4	1.05	2.52*
	Gender×Age×Eating Behavior	2.67	4	.67	1.60
	Error	67.52	162	.42	
	Total	2712.44	180		

+ $P<.10$, * $P<.05$, ** $P<.01$

Table 4. Scheffe Test of Positive Emotionality Depending on Age and Eating Behavior

Independent Variables	Group	N	Mean	SD	Contrast	
					Group 1 2 3	
Age	5 Years-old	71	3.51	.72	1	**
	6 Years-old	79	3.98	.64	2	
	7 Years-old	30	4.11	.67	3	
					Group 1 2 3	
Eating Behavior	Low	57	3.54	.78	1	*
	Medium	63	3.81	.62	2	
	High	60	4.09	.67	3	

+ Scheff test. *P<.05

Table 5. Simple Main Effects Analysis of Eating Behavior on Positive Emotionality by Age

Age	Eating Behavior	Positive Emotionality		
		M	SD	F
5 Years-old	Low	3.28	.68	
	Medium	3.61	.72	4.21*
	High	3.88	.18	
6 Years-old	Low	3.70	.79	
	Medium	3.92	.50	3.43*
	High	4.18	.62	
7 Years-old	Low	4.40	.50	
	Medium	3.92	.66	1.10
	High	4.10	.74	

* P<.05

A simple main effects analysis was performed for the influence of eating behavior on positive emotionality by age to understand the patterns of interaction effect of age and eating behavior for positive emotionality related to the hypothesis of this study. The results are shown in Table 5.

In 5 years ($F=4.21, P<.05$) and 6 years ($F=3.43, P<.05$) groups, the positive emotionality tended to increase as the level of eating behavior increased. However, the positive emotionality score was not significantly different in the 7-year-old group (depending on the level of eating behavior).

Eating Food Behavior and Negative Emotionality of Children

A 3-way ANOVA of gender (2) x age (3) x eating behavior (3) was performed with gender, age, and

Table 6. Mean and Standard Deviation of Negative Emotionality of Children by Gender, Age, and Eating Behavior

Gender	Age	Eating Behavior	Negative Emotionality		
			N	Mean	SD
Boy	5 Years-old	Low	18	3.19	.30
		Medium	10	2.88	.33
		High	9	2.43	.58
		Total	37	2.92	.49
	6 Years-old	Low	11	2.92	.43
		Medium	16	2.94	.52
		High	13	2.34	.38
		Total	40	2.74	.52
	7 Years-old	Low	4	3.50	.75
		Medium	5	2.52	.48
		High	9	2.57	.70
		Total	18	2.76	.74
Total	Low	33	3.14	.44	
	Medium	31	2.85	.47	
	High	31	2.43	.54	
	Total	95	2.81	.56	
Girl	5 Years-old	Low	16	3.05	.42
		Medium	12	2.75	.37
		High	6	2.51	.43
		Total	34	2.85	.45
	6 Years-old	Low	4	3.32	.71
		Medium	15	2.66	.43
		High	18	2.47	.48
		Total	37	2.64	.54
	7 Years-old	Low	3	3.52	1.06
		Medium	5	2.33	.63
		High	4	2.24	.24
		Total	12	2.60	.82
Total	Low	23	3.16	.57	
	Medium	32	2.64	.45	
	High	28	2.45	.44	
	Total	83	2.72	.56	
Total	5 Years-old	Low	34	3.12	.36
		Medium	22	2.81	.35
		High	15	2.46	.51
		Total	71	2.88	.47
	6 Years-old	Low	15	3.03	.52
		Medium	31	2.80	.49
		High	31	2.42	.44
		Total	77	2.69	.53
	7 Years-old	Low	7	3.51	.81
		Medium	10	2.43	.54
		High	13	2.47	.61
		Total	30	2.70	.77
Total	Low	56	3.14	.49	
	Medium	63	2.75	.47	
	High	59	2.44	.49	
	Total	178	2.77	.56	

eating behavior as independent variables and negative emotionality as a dependent variable in order to examine the influence of childhood eating behavior on negative emotionality and the changes of effects of eating behavior on negative emotionality by the gender and age of children.

Table 6 shows that the score of negative emotionality was 2.81 in boys and 2.72 in girls. By age, the negative emotionality score was 2.88 for 5 year-olds, 2.69 for 6 year-olds, and 2.70 for 7 year-olds, and showed that negative emotionality decreased by age. For eating behavior, the negative emotionality score was 3.14 in groups with low level eating behavior, 2.75 in groups with medium level eating behavior, and 2.77 in groups with high level eating behavior, and indicated a lower negative emotionality as the level of eating behavior increased. To evaluate the significance of such differences and the interaction among independent variables, a 3-way GLM Univariate was performed with the results shown in Table 7.

The main effects were as follows. The negative emotionality of children was significantly different depending on the eating behavior score of children ($F=30.01, P<.001$). Higher negative emotionality was shown in the group with a lower eating behavior score compared to the group with a higher eating behavior score. The interaction of age and eating behavior affected the negative emotionality of children ($F=2.30, P<.10$).

A Scheffe test was performed to confirm the presence of significant differences between groups of

eating behavior with the main effects and the results are presented in Table 8. There were significant differences among lower group ($M=3.14, SD=.49$) and medium group ($M=2.75, SD=.47$) and higher group ($M=2.44, SD=.49$) for eating behavior.

Simple main effects analysis was performed for the effect of eating behavior on negative emotionality by age to understand in detail the patterns of interaction effect on age and eating behavior for negative emotionality related to the hypothesis of this study. The results are as follows.

In the 5 year-old ($F=15.15, P<.001$) and 6 year-old ($F=9.70, P<.001$) groups, the negative emotionality tended to decrease as the level of eating behavior increased. In addition, in the 7 years group, the negative emotionality tended to decrease as the level of eating behavior increased ($F=7.38, P<.01$); however, there was no difference in the negative emotionality score between the medium group and higher group for eating behavior.

Table 8. Scheffe test of Negative Emotionality Depending on Eating Behavior +

Independent Variable	Group	N	Mean	SD	Contrast	
					Group 1	2 3
Eating Behavior	Low	56	3.14	.49	1	**
	Medium	63	2.75	.47	2	*
	High	59	2.44	.49	3	

+ Scheffe test, * $P<.05$

Table 7. 3-way ANOVA of Negative Emotionality of Children by Age, Gender, and Eating Behavior

Source	SS	df	MS	F	
Gender	.08	1	.08	.34	
Age	.02	2	.01	.04	
Eating Behavior	13.76	2	6.88	30.01***	
Gender×Age	.33	2	.17	.72	
Negative Emotionality	Gender×Eating Behavior	.46	2	.23	1.00
	Age×Eating Behavior	2.10	4	.53	2.30+
	Gender×Age×Eating Behavior	.87	4	.22	.95
Error	36.67	160	.23		
Total	1420.42	177			

+ $P<.10$, * $P<.05$, ** $P<.01$, *** $P<.001$

Table 9. Simple Main Effects Analysis of Eating Behavior on Negative Emotionality by Age

Age	Eating Behavior	Negative Emotionality		
		M	SD	F
5 Years-old	Low	3.12	.36	15.15***
	Medium	2.80	.35	
	High	2.46	.51	
6 Years-old	Low	3.03	.52	9.70***
	Medium	2.82	.49	
	High	2.42	.44	
7 Years-old	Low	3.51	.81	7.38**
	Medium	2.43	.54	
	High	2.47	.61	

* $p < .05$, ** $p < .01$, *** $p < .001$

DISCUSSION

This study investigated the eating behavior established during childhood, the influence of eating behavior on the positive emotionality and negative emotionality of children, and the pattern of influence of eating behavior on emotionality depending on the age and gender of children. For the purposes of this study, 183 children aged 5, 6, and 7 years-old were selected from 3 nurseries and 1 kindergarten located in Seoul to investigate the emotionality by child's eating behavior. The results, conclusions, and discussion on the eating behavior and emotionality evaluated by teachers are as follows.

First, a child's eating behavior significantly affects the positive emotionality of the child. The children group with higher levels of eating behavior showed higher positive emotionality scores compared to the group with lower levels of eating behavior. In addition, the main effect by age was significant and the older groups showed a higher positive emotionality scores compared to the younger groups. On the other hand, the main effect by gender was not significant and similar levels of positive emotionality were seen in boys and girls. In addition, the interaction of eating behavior and age was significant and the influence of eating behavior on positive emotionality was different depending on the age of the children. In the 5 year-old and 6 year-old groups, the positive emotionality tended to increase as the

level of eating behavior increased; however, the positive emotionality score was not significantly different depending on the level of eating behavior in the 7 year-old group and showed a similar emotionality.

Children with generally higher levels of eating behavior such those c that enjoyed meals, had a good appetite, and displayed regular eating habits show a balanced nutritional status. This can be interpreted that such a positive state can influence the positive emotionality of children and that the positive emotional experience in eating behavior affects the basic emotional conditions.

The influence of eating behavior on child's positive emotionality was significant in the 5 year-old and 6 year-old groups; however, the difference of positive emotionality by eating behavior was not significant in the 7 year-old group. This can be interpreted as a characteristic of emotionality development. The age of 7 is the stage of entering into the childhood, and children of early-childhood show relatively consistent emotional development patterns since emotional understanding, emotional regulation, or emotional expression have matured. Children at the age of 7 have already established emotionality with controlled responses for strange situations or new environments and might have temporary emotional changes that are less influenced by other external variables. Through these results, the appropriate time of dietary education or eating behavior establishment can be estimated. To achieve positive developmental effects including emotionality of children through dietary education, it is appropriate to provide education for 5 year-old and 6 year-old children in early-childhood when eating behavior can influence child development.

Second, the negative emotionality of children was significantly different depending on the child's eating behavior score. Children with a lower eating behavior score showed a higher negative emotionality compared to those with a higher eating behavior score. The main effect by age and gender were not significant; in addition, the interaction of age and food behavior affected the negative emotionality of a child. As in the case of positive emotionality, children with generally good eating behavior such as

those that enjoyed mealtimes and regular eating habits can be interpreted as showing less negative emotionality. Children that experienced more positive emotionality with higher levels of eating behavior, experienced less desired responses (such as sadness, fear, or anger), and with consistent experiences in continuous eating behavior had a reduction in the negative emotionality of children.

The interaction of age and eating behavior is shown the following results. In all of the 5, 6, and 7 year-old groups, significant differences in negative emotionality were shown depending on eating behavior; however, there was no significant difference in negative emotionality. In the case of the 7 year-old group, between children with medium levels of eating behavior and those with higher levels of eating behavior. Such results (as in the case of positive emotionality) can be interpreted that the influence of eating behavior on a child's emotionality is smaller in the 7-year-old group compared to the 5 and 6 year-old groups.

In conclusion, it has been shown that child's eating behavior influences emotionality and children with better eating behavior show more positive emotional responses and less negative emotional responses in the same situation. Thus it is necessary to establish good eating behavior through proper dietary education and guidance during childhood to influence the completion of child's developmental tasks, the establishment of basic living habits, and the general development of children, particularly positive emotional development (Ohm, 2004; Seo & Shin, 2009).

This study has a few limitations. Although the eating behavior of children has positively influenced a child's emotionality, the influence of external variables that include relevant parental factors like education, SES, parenting behaviors and children's temperament cannot be excluded. Therefore it is recommended that follow-up studies be used to verify whether the same results are observed even after the control of external variables. In addition, we used CBQL for the measurement of children's positive and negative emotionality. However, CBQL was originally developed for children's behavior problems with the number of questionnaire for

negative and positive emotionality unbalanced. Therefore, we suggest a balanced questionnaire for future research.

Despite the above limitations, the following suggestions are made through the results of this study. First, the importance of eating behavior is reemphasized through the study results and the dietary education is recommended at nurseries, kindergartens, or homes for desirable eating behavior. Dietary education should be provided for children to promote the development of the whole individual beyond the present nutrition-focused dietary education. In addition, the desirable time for dietary education is in early-childhood and before childhood.

This study demonstrated that eating behavior influences the social and emotional development of children (such as emotionality) as well as creating a positive influence on the general nutritional status and physical health of children. In addition, it demonstrated that the establishment of good eating behavior is important and that proper dietary education is required to accomplish this. Dietary education is a lifetime educational program that should be continuously provided; however, it should be started and emphasized in early-childhood in consideration of the developmental needs of young children.

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