

## What Counts the Most for Early Literacy Acquisition? : Japanese Data from the Cross-cultural Literacy Survey of GCOE Project.

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### Abstract

In Study 1, The level of literacy in preschool children is deeply related to the level of cognitive development. The goal of this research is to explore how socio-economic factors and parental styles for child care and discipline affect children's literacy and vocabulary size. We examined the relationship between various socio-economic factors as well as attitudinal factors, and level of literacy and vocabulary size in children across three Asian countries including Japan, Korea, and Mainland China. From Japanese Data, it was clarified that children's vocabulary size was improved in families where adults try to treat their child as an equal and share happy experiences with him/her. This research revealed that a child's literacy and size of vocabulary were affected by their parents' economic gap factors. However, the child's abilities are not solely dominated by those economic factors alone, and other family factors, such as the budget of investment in education, the size of a picture book collection, etc. also play important roles. In Study 2, we examined the relationship We did a follow-up study for the three hundreds and twenty one children after they entered the first grade of elementary schools. The children took the "Japanese Ability Test" and a vocabulary test. Styles of discipline at preschool age were significantly related with Japanese ability and vocabulary. In particular, children disciplined in the "sharing type" style during their preschool years tended to have higher Japanese ability and larger vocabulary, while those disciplined in the "authoritarian type" style often scored lower.

**Key words:** socio-economic factors, literacy, vocabulary size, a follow-up study the "sharing type" style, the "authoritarian type" style

### Study 1

The acquisition of literacy (the ability to read and write) by preschool-age children is deeply related to their cognitive development. In addition, it has been identified that a child's vocabulary can be an index to his/her intellectual development and level of learning aptitude. (Uchida, 1989; 2007; Azuma, et al., 1995)

Literacy ability is the foundation of learning and is important building a block for general intellectual ability. It is known that literacy in childhood is closely related to general cognitive ability and also influences their academic success in later ages. Thus, it is critical to understand how children's environment affects their literacy ability.

The first objective of this study 1 was to make a comparison with the results of the survey carried out in 1995. The second was to clarify how their parents' investment in education and socio-economic factors affected the children's literacy and vocabulary. Thirdly, the research was intended to identify the relationship between children's literacy and vocabulary, and the

parents' styles of discipline as well as their sensitivity towards their children and pro-sociality assessment measured with a SDQ scale.

### Methods

It has been discussed how environmental factors affect children's literacy acquisition. Here, the influence of socio-economic factors such as home income has been much investigated, as economic gaps among families are growing bigger now. On the other hand, factors other than socio-economic factors, such as parental attitude for child care and style of discipline have not been fully examined. We investigated what factors influence children's literacy ability during preschool years, with special interest in clarifying the influence of parents' attitude toward child care and style of discipline.

We conducted three surveys: Child Interview Survey, a Parent Questionnaire Survey, and a Care Giver Survey.

1. Infant Survey: A clinical interview was held with each of the 2,734 preschool-age children, including 828 three-year-olds (392 boys and 381 girls), 956 four-year-olds (472 boys and 442 girls), and 950 five-year-olds (476 boys and 444 girls), to measure his/her 1) ability to read and

write 2) phonological awareness, 3) vocabulary size, and 4) knowledge of alphabets. Further, another clinical interview was conducted with each of the children to examine his/her 5) awareness of the value of literacy tools.

2. Parent Survey: With the participation of 1,780 parents of the children surveyed, a questionnaire was held to find out their views regarding children, efforts in early education, children's pro-sociality, styles of discipline, size of book collection, budgets of investment in education, income, etc.

3. Child care Provider Survey: Another questionnaire survey was carried out on 100 care providers who worked in the child care centers and kindergartens the surveyed children attended to learn about the preschool literacy education provided, their styles of child care, child care environment, how they treated children, etc.

## Results

### *Relationship between preschool children's literacy acquisition, and their family and child care environments*

The major results regarding the relationship between preschool children's literacy acquisition, and their family and child care environments are listed below:

1. Compared with the results from the 1995 survey, literacy acquisition took place earlier (80% among the 5-year-olds, compared with 48% in 1995).

2. While for the 3- and 4-year-olds literacy acquisition was affected by the parents' economic gap factors (the parents' economic status and budget of investment in education, with CP = 7 million yen), parents' academic history, size of book collection, and style of discipline, for the 5-year-olds, economic gap factors no longer influenced literacy acquisition.

3. While some gender gaps were found in literacy (females higher than males) and the size of vocabulary (males larger than females) among the 3- and 4-year-olds, the gaps disappeared among the 5-year-olds.

4. With regard to the size of vocabulary, influences from economic gaps and different styles of discipline became more evident as the children grew older, and were most evident among the 5-year-olds.

5. The family environment (economic gap factors and styles of discipline) and the style of child care (authoritative or child-centered) were related to each other. The research suggested that, in the 5-year-olds, the style of child care could offset the effects from the economic gap factors in literacy acquisition.

6. Phonological awareness (internal factors) of "seion" ("clear" syllables of Japanese) reached its peak among the 5-year-olds, making evident the effects from teaching (external factors: authoritarian style of child care, early "drill" lessons, etc.)

7. We extracted three different factors regarding the style of discipline, namely, the "sharing type" (try to share

the child's experiences, with an emphasis on communication and contacts), "authoritarian type" (top-down discipline, or discipline with force), and "self-sacrifice type" (find child rearing too burdensome, and either suffer from child-rearing anxiety or leave their child alone). The authoritarian type was more common among lower-income parents and the sharing type among higher-income parents.

### *The relationship between with the reading, writing and vocabulary test scores and home income*

As expected, children's literacy ability was correlated with their home income in some degree. Figure 1 showed the relationship between with the reading, writing and vocabulary test scores and home income. Firstly, for three and four years old, their reading scores were affected by the level of parents' home income. However, by five years of age, the influence of home income on reading scores is no longer seen (Figure 1). Writing score was affected by the parents' home income for the three- and four-year-olds, but again, the influence of the home income factor was not found for the five-year-olds (Figure 2). Vocabulary score was affected by home income for four- and five-year olds (Figure 3). For five-year-olds, home income is no longer related to reading and writing ability, but here, home income did seem to be related to the size of vocabulary.

However, our interest is whether home income is more important than parents' style of discipline.

### *Relationship between styles of discipline, and literacy and vocabulary*

What influences do styles of discipline have on children's literacy and vocabulary? We examined whether or not there is any significant correlation between the two, with the parents' income under control, as well as whether parents' styles of discipline affect their children's performance in terms of literacy and vocabulary among lower-income families.

To evaluate the relative importance of the socio-

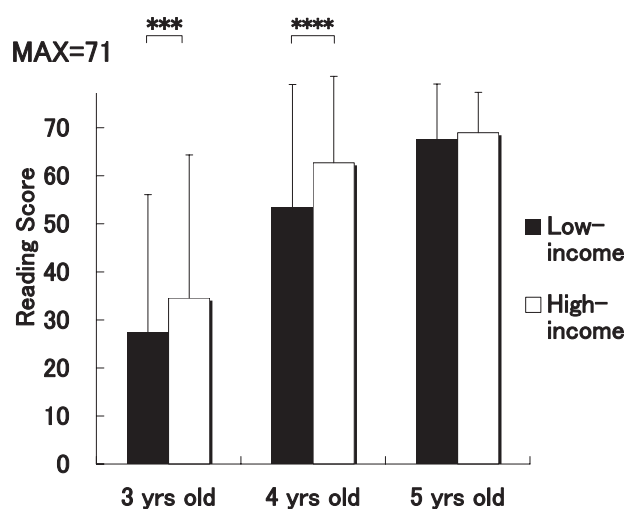


Figure 1. Reading score and home income

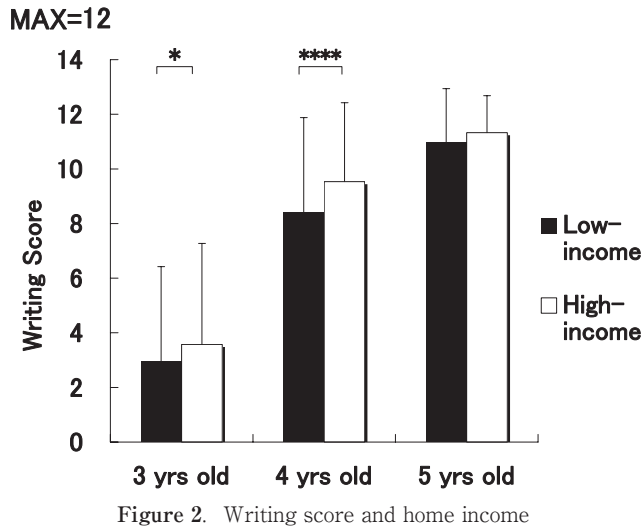


Figure 2. Writing score and home income

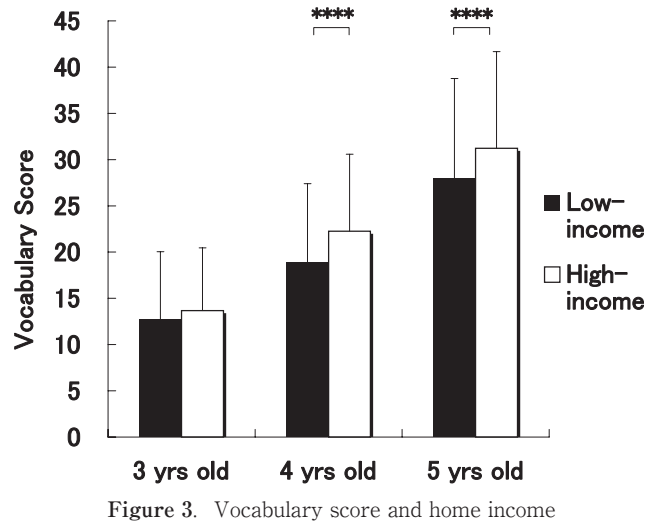


Figure 3. Vocabulary score and home income

economic factors and parents' attitudinal factors, we first attempted to extract types of discipline styles through factor analysis of the parental questionnaire survey.

#### 1. Classification of styles of discipline

We conducted a factor analysis of the styles of discipline by parents on a scale and extracted three factors, namely, the first type is for parents who try to share experience with children and place emphasis on communication and contacts. We named this type "sharing style." Parents from the second type think that training children is parents' role, and it's natural to punish them if they behave badly. We labeled the style of those parents to be "authoritarian style." The third type is the "self-sacrifice type", that is differentiate in child rearing too burdensome, and either suffer from child-rearing anxiety at higher-income families, and in child rearing for mother to leave their child alone and neglect at lower-income families (Table 1).

Each individual subject was allocated to one of those three styles, the one for which that individual's standardized score was the highest. The resulting classification turned out to be fairly even, where 33.4% (573) of the subjects were in the sharing type, 35.6% (612) in the authoritarian type, and 31.0% (532) in the self-sacrifice type.

The family environment, home income, economic gap factors and styles of discipline (authoritarian or self-sacrifice) were related to each other. The research suggested that, in the 5-year-olds, the style of child care could offset the effects from the economic gap factors in literacy acquisition. Correlation between the styles of discipline and children's literacy was examined. There was no difference by styles of discipline with regard to reading and writing ability (Figure 4). While influences on literacy from the economic and gender gaps became insignificant when a child reached the age of 5 years,

Table 1. Factors Extracted for Styles of Disciplines

Questions	I	II	III
Must many rules and clamor children	0.59	0.59	-0.06
Pillory until children behave as they are told	0.58	0.58	0.07
Punishment is necessary for discipline	0.52	0.52	-0.22
Should punish children for bad behaviors	0.52	0.52	-0.23
Enforce obedience to children	0.5	0.5	-0.02
Din children many times in detail	0.49	0.49	0.15
Want to control children as much as possible	0.47	0.47	0.13
Repeatedly order what to do to children	0.45	0.45	0.23
Spend good time together with children	-0.04	-0.04	-0.02
Like going out/travel together with children	-0.03	-0.03	0.01
Often talk to children	0.03	0.03	0.05
Always think of what children would enjoy	0.09	0.09	0.16
My life is organized around my child	-0.02	-0.02	0.6
Children are important than anything else	-0.08	-0.08	0.48
Dedicated to children despite myself	-0.01	-0.01	0.45

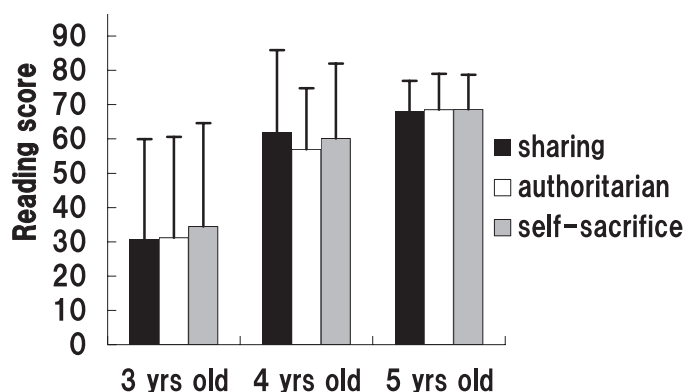


Figure 4. Styles of discipline and reading/writing ability

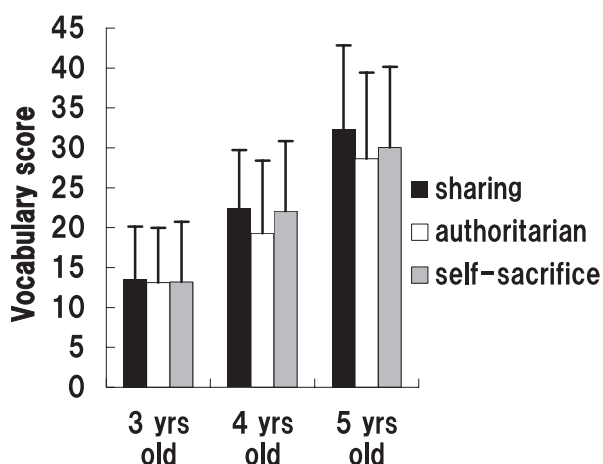
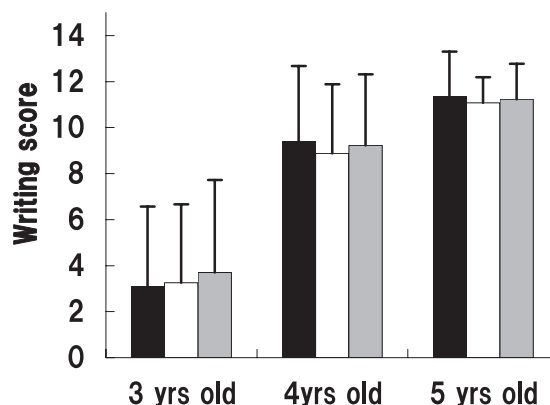


Figure 5. Styles of discipline and vocabulary ability

influences on the size of vocabulary (an index to the foundation of learning) from the economic gap factors grew more evident as the child grew older, for the vocabulary score, influences from the styles of discipline became evident. To repeat, “sharing style” means that parents try to share the child’s experiences with an emphasis on communication and contacts (Figure 5). In addition, the style of discipline and the size of book collection have a strong positive correlation with the size of vocabulary.

These findings suggest that a child’s vocabulary improved in families where adults try to treat their child as an equal and share happy experiences with him/her. We suppose that a family atmosphere of having fun and enjoying conversations together stimulates intellectual curiosity inside a child and incites him/her to search her/his environment, resulting in learning using his/her own initiative. Thus, this research revealed that a child’s literacy and size of vocabulary were affected by their parents’ economic gap factors. However, the child’s abilities are not solely dominated by those economic factors alone, and other family factors, such as the budget of investment in education, the size of a picture book collection, etc. also play important roles.

Below, we consider influences on vocabulary building

from how a child’s environment is arranged and from how he/she is treated by his/her parents.

## 2. Relationship between styles of discipline, and literacy and vocabulary

We conducted an analyses on the variance of the individual subjects’ scores and found no significant difference in literacy due to the styles of discipline. However, in vocabulary, those styles resulted in a significant effect ( $F(2,1708) = 11.16, p < .0001$ ), with the children disciplined in the “sharing type” style scoring better in vocabulary than did those disciplined in the “authoritarian” style (Tukey’s method with  $p < .01$ ).

## 3. Multiple regression analyses of factors determining literacy and vocabulary

We conducted a multiple regression model to examine the relative contributions of home income and discipline styles along with age, sex, and mother’s final level of education on the vocabulary scores. All these factors significantly contributed to the model. What should be noted is the fact that, after considering the influence of other factors, especially the influence of home income, the two style of discipline factors were significant for the model.

The difference between the authoritarian and sharing styles was significant in vocabulary alone (Table 2). Further analysis found out that there was a significant relationship between the income and the “authoritarian type” style of discipline in the vocabulary score ( $\beta = .05, p < .05$ ). Influences due to the “authoritarian type” style of discipline, though evident among the lower-income families ( $\beta = .10, p < .05$ ), were not recognizable among the higher-income ones ( $\beta = .01, p = .70$ ). The interaction between the income and “sharing type” style of discipline was insignificant ( $\beta = .01, p = .63$ ).

The analyses described above proved that the style of discipline was correlated with the size of the child’s vocabulary, even with the economic gap factors under control. We confirmed that the vocabulary scores significantly declined in children of lower-income families that tended to have a “authoritarian type” style of discipline. Especially notable is the fact that the “sharing type” style of discipline prevented such a decline in

**Table 2.** Multiple regression model

	Vocabulary score		Reading score		Writing score	
	$\beta$	$r$	$\beta$	$r$	$\beta$	$r$
Children's age	.61***	.60***	.55***	.55***	.71***	.71***
Children's sex	-.08***	-.08***	.08*	.08*	.13***	.12***
Income	.06**	.12***	.09*	.13***	.07***	.10***
Mother's a level of education	.12***	.11***	.08*	.07**	.04*	.01
Authoritarian style	-.05***	-.04*	-.03	-.02	.01	.03
Sharing style	.05**	.05*	-.01	-.01	-.02	-.02

vocabulary ability, even in children of lower-income families. The style of discipline is something the parents can change, if they modify the way they treat their children. Thus, we believe one urgent and important task for researchers of this field is to make effective suggestions on child care to parents.

## Study 2

We also did a follow-up study for the three hundreds and twenty one children after they entered the first grade of elementary schools. To consider how a five-year-old child's literacy and vocabulary influence his/her ability of Japanese and vocabulary after he/she has finished the first year in elementary school. The children took the "Japanese Ability Test" which tests their reading ability, syllogism inferences, composition, copying, writing of Chinese characters, and a vocabulary test.

## Method

**Test subjects:** Of the 920 five-year-olds (476 boys and 444 girls) covered by the preschooler survey, 320 (154

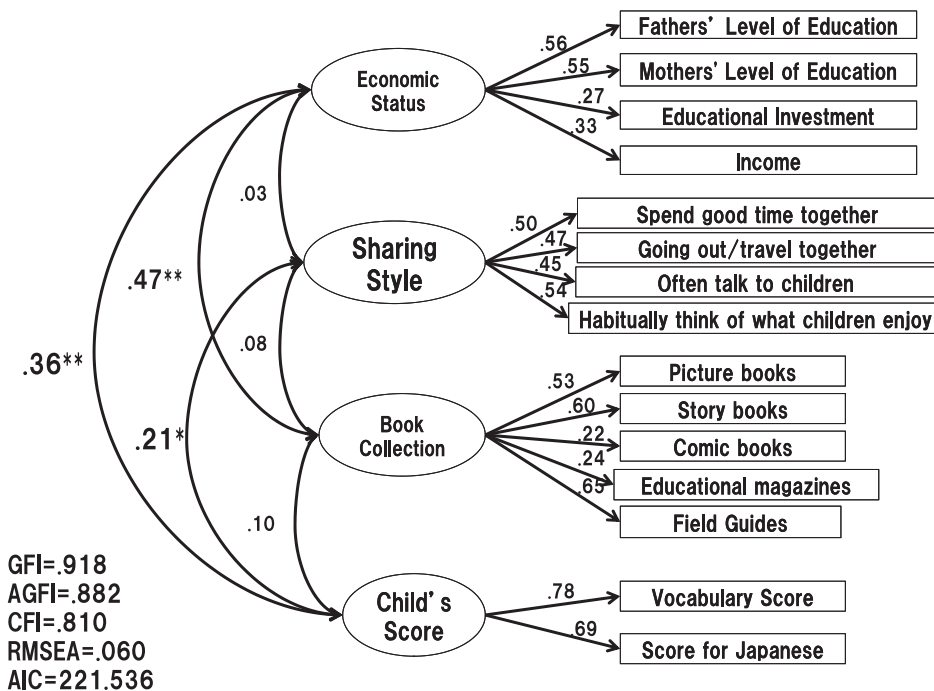
boys and 167 girls) participated in this follow-up survey, which was conducted during the last three months of their first year in elementary school.

**Procedure:** The children took the "Japanese Ability Test" (which is consists of testing the examinee's reading ability, syllogism inferences, composition to provide reasons for a conclusion given at the beginning, copying, and writing of Chinese characters) and a vocabulary test. They took these tests in small groups, in either elementary school classrooms or nursery rooms of child care centers and kindergartens.

## Results

### 1. Literacy at Preschool age & Japanese Ability/Vocabulary knowledge in First Grade

We conducted multivariate analysis of variance (MANOVA) of factors determining Japanese ability and vocabulary to see whether or not gender, family income, and/or the style of discipline are factors determining the Japanese ability and vocabulary of the first graders. The only determinant factor was gender, with the girls scoring significantly better than the boys did.



**Figure 6.** How do Socio-economic factors and/or styles of discipline affect to the literacy development? : "Sharing style"

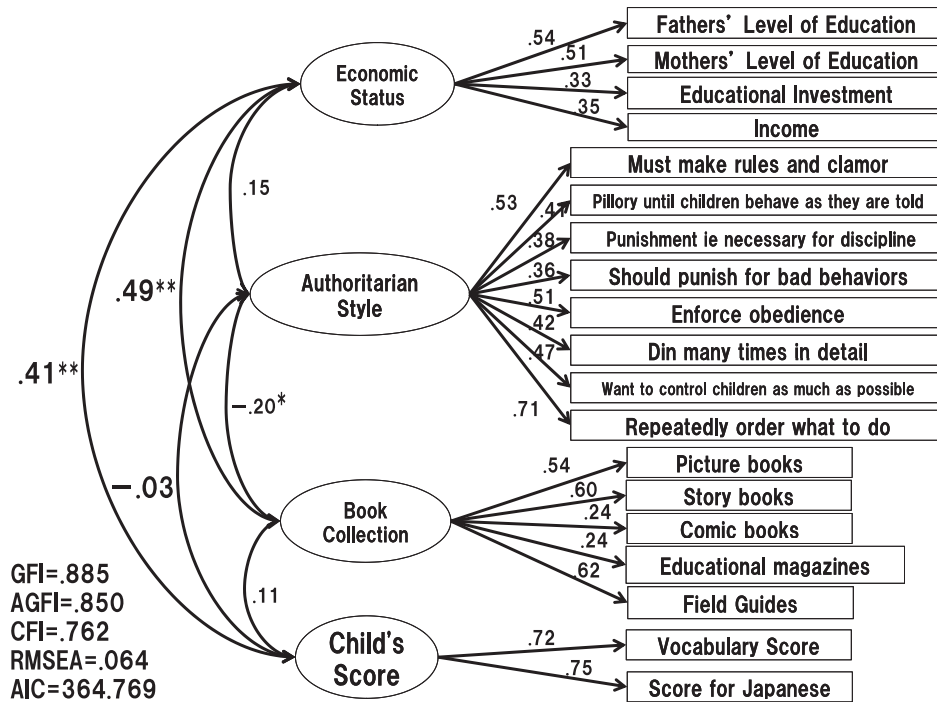


Figure 7. How do Socio-economic factors and/or styles of discipline affect to the literacy development? : "Authoritarian style"

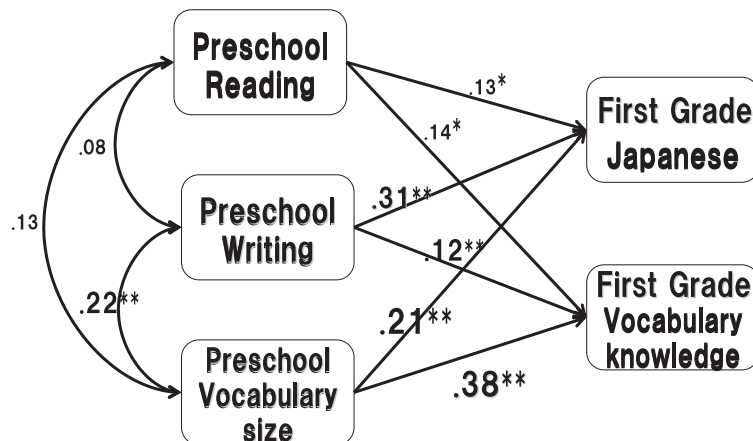


Figure 8. Literacy at preschool age & Japanese ability/vocabulary knowledge in first grade

## 2. Multiple regression analyses of the factors determining the Japanese ability and vocabulary

While the family income in the preschool years is irrelevant to the Japanese ability and vocabulary of the children in their first year of elementary school, styles of discipline were significantly related with such ability and vocabulary. It was revealed that styles of discipline are among the factors determining Japanese ability and vocabulary. Styles of discipline at preschool age were significantly related with Japanese ability and vocabulary. In particular, children disciplined in the "sharing type" style during their preschool years tended to have higher Japanese ability and larger vocabulary (Figure 6), while those disciplined in the "authoritarian type" style often

scored lower (Figure 7).

Our multiple regression analyses clarified that preschool-year writing ability and vocabulary are among the factors determining children's Japanese ability and vocabulary in their first year of elementary school ( $p < .01$ ). The analyses also found that preschool reading ability affected the Japanese ability and vocabulary in their first year ( $p < .05$ ) (Figure 8).

To quickly scoop results from other counties, results were similar in Japan and Korea where sharing style is correlated with vocabulary score. However, in China, sharing style is correlated with vocabulary at 3 years old, but authoritarian is correlated with vocabulary at 4 and 5 years old.

## 3. The test subjects' tendencies in reading and awareness



*of the benefits of literacy*

(1) About 91% of the test subjects read a book or more during the preceding Christmas/New Year holidays, with the largest group having read 1 to 5 books.

(2) The numbers of books they read had nothing to do with the test subjects' preschool-year literacy and child care environment. Deeper analysis of what they read suggested that reading instructions from their elementary school teachers were more influential.

(3) Whether they liked or disliked composition: Almost half (49.5%) of them replied "neutral," while 35.7% said "I like it" and 13.7% said, "I don't like it." Thus, in the first year, only about 10% of elementary pupils disliked composition.

(4) Awareness of the benefits of literacy: We asked each subject two questions, "Do you find it helpful to be able to read?" and "Do you find it helpful to be able to write?" With regard to the reading question, 37.5% of the elementary subjects responded affirmatively, compared with 27.7% among the preschoolers. We saw more replies describing specific benefits related to communication and learning, such as "Now I can read books containing Chinese characters. For instance, I can read a story for children named 'Kaze no Matasaburo'." For the writing question as well, 33.5% of the elementary subjects replied affirmatively, compared with 24.4% among the preschoolers. More subjects replied in specific terms that they were now able to communicate beyond time and space, for example "It's great now I can write letters," and "Now I can communicate my feelings in writing as well, not just orally." The more they practice reading and writing, the more they become aware of the benefits of literacy. We suppose that many children recognize what good reading and writing can do to them, as they grow better in these two abilities.

## Concluding Discussion

*Findings of two studies*

1. Acquisition of literacy; while economic gap factors significantly affect a child's literacy in the early preschool years, this influence decreases in the latter preschool years, with many poorer children catching up with wealthier ones in terms of literacy. While preschool writing ability has a significant correlation with children's Japanese ability in their elementary years, preschool reading ability has a weak correlation.

2. The development of vocabulary size; While boys scored higher than girls did in vocabulary during the preschool years, in elementary school, girls outscored boys. Preschoolers' vocabulary is correlated to their parents' economic gap factors and budgets of investment in education, these become irrelevant to elementary students' academic performance examination scores and vocabulary. In the follow up study, we have found that

preschool vocabulary is strongly related with Japanese ability during the elementary school years. In short, preschool vocabulary is part of the foundation for academic performance. This confirms the results from the 1995 research, and we can now believe that better vocabulary aids learning in elementary school. It suggests that children disciplined in the "sharing type" style tend to have higher Japanese Achievement test score and vocabulary score even in later ages.

3. Relationship between styles of discipline, and Japanese ability and vocabulary; Looking at the different styles of discipline by the parents, we have found that the "sharing type" style can enhance a child's vocabulary and Japanese ability, while the "authoritarian type" style can suppress them. Again, we see that preschool vocabulary can be part of the foundation for Japanese learning in elementary school, to the extent that we can predict how well a child will learn Japanese based on his/her preschool vocabulary.

Home income does seem to be related to children's literacy ability. However, it is important to note that home income is not the only factors, but parents' styles of discipline play a very important role as well. Moreover, the size of vocabulary at preschool age does affect general Japanese ability in later ages.

*Suggestions to parents;*

From this study we suggest followings to parents.

1. Do not be obsessed with your preschool child's current reading and writing abilities. What really matters is to help them develop good thinking and imagination, which they will want to express in writing once they acquire some literacy skills.

2. Vocabulary is part of the foundation for learning, and a good vocabulary builds up in a child disciplined in the child-centered, "sharing type" style.

3. Parents can change and control their own style of discipline.

Styles of discipline hold the key to correct (overcome) economic gaps among families. Parents should treat their children as persons and try to build a relationship on equal terms with them, respecting their interests, concerns, and autonomy. In this way, parents should try to have more conversations and spend more time with their children.

What is most important for the preschool period is not to develop the literacy ability but to develop the desire to express thoughts. However, it is true that vocabulary is part of the foundation for learning, and good vocabulary is fostered by sharing type style.

We would like to emphasize that parents can change and control their own style of discipline, and styles of discipline hold the key to overcome economic gaps among families. Parents should respect their children and try to spend more time with them.

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