

Relationship between the Simplicity and the Reaction in Children

Katsuji Miyazawa, University of Tsukuba

Yamanaka Toshimasa, University of Tsukuba

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Abstract

This research started with simple question. What characteristics of simplicity affect the reaction of child? Also, we tried to understand the children's reaction categorized by various elements of profile, through their way of play.[1],[2],[3]

Firstly, we designed unusual building blocks. One system consists with just a series of quadrangle and triangle with three differences in thickness. The other system mainly consists with round shape like large cookie with small dimple in their center. Former system have limited ability of represent the shape, later one have unstable because of its limited and rounded form to build up. We studied with those sets and typical building blocks popular in Japan.

As a result, we found there is no relations between simplicity and children's interests. That means complexity is not the characteristics to attract children. Also we found a relationship between the social attitude of children, age and the difficulty of use.[4]

1. Preface

By the time children grow up to be a 6 years old, they will spend about 15000 hours on playing. If it will be averaged on a day, it will become in no less than about 7 - 9 hours. Through playing, they grow up physically and mentally.

When their play is observed, there is surely a toy in play. They are various things or material, or their own body, or other children, and adult. Although we do not think that a toy is necessary to play, the rate of a toy occupied to the act of playing increase in every year.

Playing is process that a child meets a lot of thing, which was not known until now, and experiences from a spontaneous interest or curiosity. A common world with others is produced from play. Diversity and complexity of human society, peculiarity, similarity, and a means of communication with the others are also grown up through play.

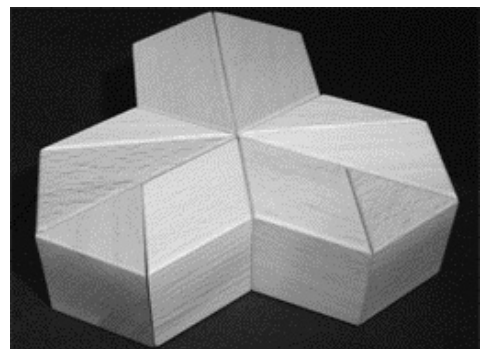
There are various toys as a thing, which supporting these plays and it is thought that qualitative and quantitative diversity of play varies with toys, used for play. What feature of toy affects on play of children and reactions of them?

In this research, we observed how child who are 2 or 3 or 4 years old would develop play using three kind blocks, and considered from following viewpoints. First, it is development of imaginal play. Second, words which children said in play.

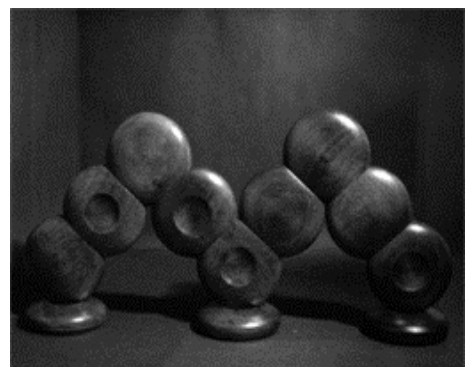
2. Process of Experiment s

Research consists with two steps. At first, we designed unique building blocks. One system consists with just a series of quadrangle and triangle with three differences in thickness (Figure 1, Figure 3). Another system mainly consists with round shape like large cookies with small dimple in their center (Figure 2, Figure 4). Former system have limited ability of represent the shape, later one have unstable because of its limited and rounded form to build up.

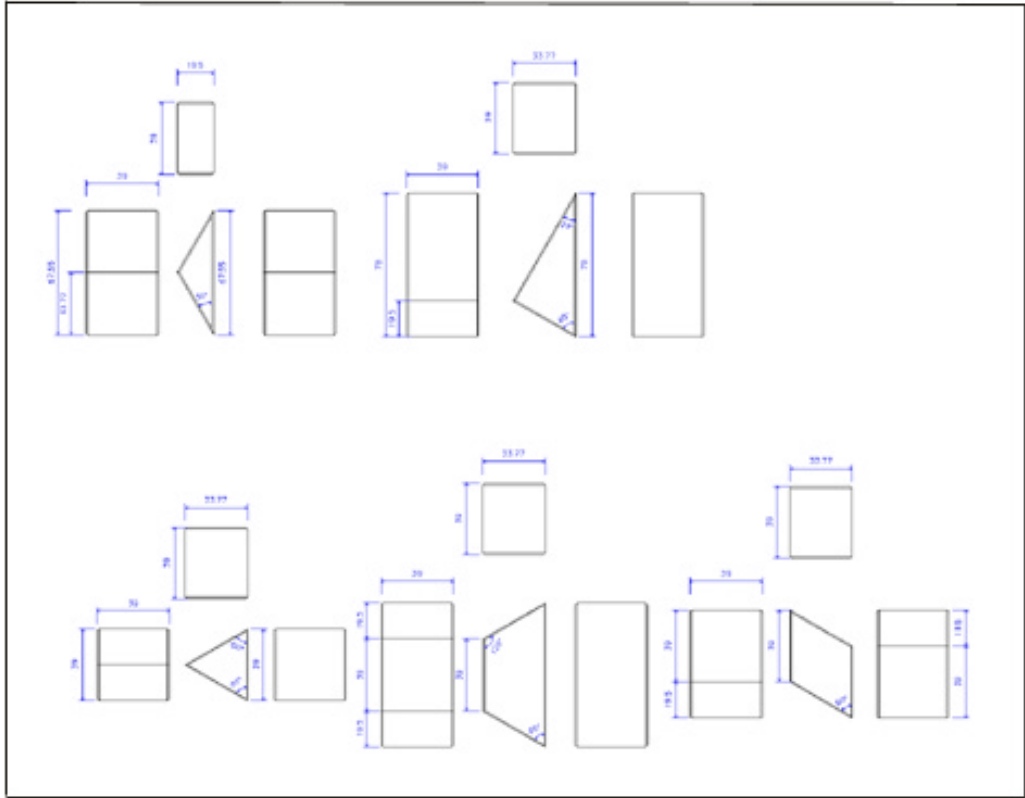
In the second step, We made children play those building blocks sets and standard building blocks popular in Japan (Figure 5) to observed and considered relationship between the simplicity and the reaction. Then we made transcription from VTR, and adjusted these data.



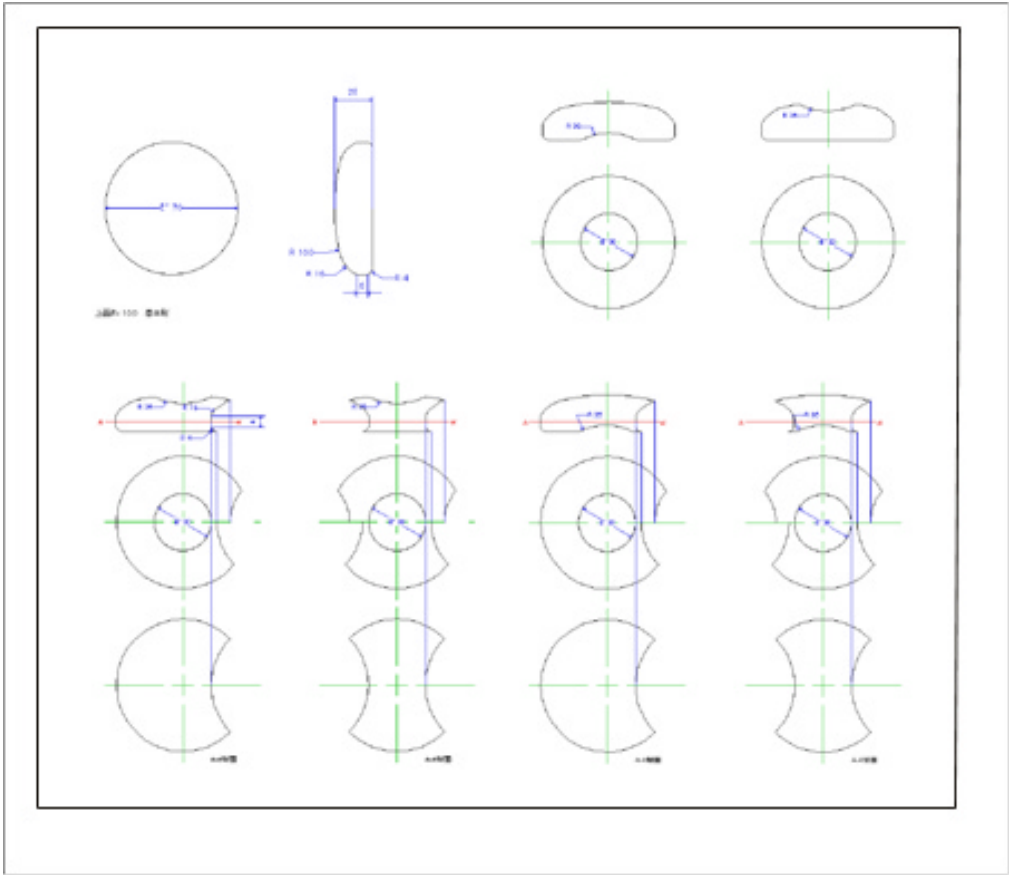
(Figure1)



(Figure 2)



(Figure 3



(Figure 4)



(Figure 5)

3.Experiment

3.1 Condition

Cases were divided into nine groups by the experimental design with three major factors (Table 1). Firstly, age is important factor. As combination of testee, we divided into three kinds, child alone, child with mother, and child with friends. As a third factor, the variation of the building block was added. All the figures that a child plays were recorded on videotape. Although an observer responds to appeals of child at worst, they did not respond positively.

Testee: 20 kindergartner who live in Tsukuba city in Japan.

Table1: arrangement

case	Age	combination	form of blocks
A	2	Individual	Standard
B	2	Group*	Round
C	2	Child & Mother	Angle
D	3	Individual	Round
E	3	Group	Angle
F	3	Child & Mother	Standard
G	4	Individual	Angle
H	4	Group	Standard
I	4	Child & Mother	Round

*The number of the group is five people.

3.2 Equipment

Sample building blocks: Standard building blocks (4-sets). Round style building blocks (7-sets),
Angle style building blocks (10-sets).

Recorder: Digital still camera (Sony DSC-F505V), Digital video camera (Sony DCR-PC5)

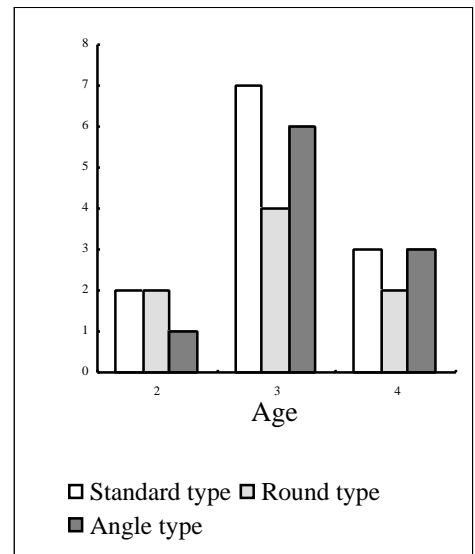
3.3 Result

3.3.1. Development of imaginal playing

The way of play and remarks by children were taken out from videotape. Then, we considered how much imaginal play would be performed by the kind of building blocks and age. Imaginal playing can be defined as following condition can be confirmed in a series of play. [7].[8]

- 1) A series of acts show one episode.
- 2) The language expresses specific conditions and scene.
- 3) A child acts as the part.

As a whole, 2 years-old children have hardly checked imaginal playing, 3 years-old children have checked a lot of imaginal playing, but 4 years old, imaginal playing has tended to reduce. Tendency is remarkable even if it considered by building blocks, because, they did not develop their language ability. Little of imaginal playing in 2 years-old children can consider that they are linguistically underdeveloped and un-progressing of imaginative power. Therefore, even if they saw an abstract form like blocks, they could not make a concrete image, and could not play. They becomes 3 years-old children, for growth of language ability and mind, they could make a lot of concrete images from an abstract



(Figure 6)

form. According to the graph, 3 years old is the peak of imaginal playing, and they become 4 years old, imaginal playing is decreasing. In this graph, it does not become clear whether 3 years old is time when play is the most prosperous or they becomes 4 years old, time to spend on one play will become long yet.

Second, we directed our attention to their speech and words (Table 2).[9],[10]

As for children' age, when an age is low, an utterance is a one word. Though there are many utterance which expressed conditions like red and green in 2-yaers old, there are a lot of utterance which expressed imaginary things 3-years old and 4-years old. Also, 3 years old made remarks most abundantly.

As for the building block, there were many utterances about Standard type and Angle type. But, there is development of Round type and Angle type in the idea more than Standard. For example, though there are many utterances that relate to the shape in Standard type, there are many expressions of the shape that doesn't look like a part in Round type and Angle type.

Table2: Words in imaginal playing

		Case		
		Standard	Round	Angle
Age	2	Red, Green	Round, Bang	Mountain, Seesaw
	3	House, Chair, Big air plane, Frying, Red, same thing, Roof	Corridor, Round, Ant, Dumpling	Rain, Garden, Clothes-pin, Car, Slide, Fanny shape
	4	Domino, Red, Air plane	Dumpling, Bean-jam bun	Scissors, Mountain, Air plane

3.3.2. The analysis of covariance

First, the average of the playtime by child and all the playtime in every case were taken out from the vide tape (Table 3). The following standard was established as an index of playtime.

(1) Be a series of play.

(2) The concentration power is to last.

Table 3

Case	Age	Building blocks	testee	playtime/5min. (sec.)	playtime AVE./times (sec.)
A	2	Standard	I*	153	21.8
B	2	Round	G**	160	20
C	2	Angle	P***	84	10.5
D	3	Round	I	127	24.3
E	3	Angle	G	157	15.8
F	3	Standard	P	195	26.1
G	4	Angle	I	182	45.5
H	4	Standard	G	230	57.5
I	4	Round	P	167	41.7
*I=Individual **G=Group ***C=Child with parent					

Second, we use Analysis of variance to examine the relationship between the testee's attribute and the difference in the characteristics of the building block. The average of the playtime and all the playtime were used as a independence variable, and characteristics of the building blocks was used as a subordinate variable in the analysis of variance. The characteristic of the building blocks was divided into color, variation, form, stability, and size. The data seat used for the analysis is following (Table 4).

Table 5-1, Table 5-2 show the result of the analysis of covariance. In this analysis, we adopted the playing time for around five-minutes and the average of continuos time per times as an index of the children' curiosity. [5],[6]

Table 4

case	Age	type	testee	playing time/5min(sec)	playing time AVE./times(sec)	sex	age	conditi on	color	variati on	form	stabilit y	size
A	2	Standard	Individual	153	21.8	1	1	1	2	2	1	1	2
B	2	Round	Group	160	20	2	1	3	1	1	2	3	3
C	2	Angle	with Parent	84	10.5	2	1	2	1	3	3	2	1
D	3	Round	Individual	127	24.3	1	2	1	1	1	2	3	3
E	3	Angle	Group	157	15.8	1	2	3	1	3	3	2	1
F	3	Standard	with Parent	195	26.1	2	2	2	2	2	1	1	2
G	4	Angle	Individual	182	45.5	1	3	1	1	3	3	2	1
H	4	Standard	Group	230	57.5	1	3	3	2	2	1	1	2
I	4	Round	with Parent	167	41.7	1	3	2	1	1	2	3	3

Table 5-1: Result of ANOVA for experiment

	sex		age		condition	
	F value	P value	F value	P value	F value	P value
playing time/5min(sec)	0.593	0.4666	4.809	0.644	0.682	0.002
playing time Ave./times(sec)	2.355	0.1687	19.873	0.003	0.002	0.9678

Table 5-2

	variation		form		stability		size		color	
	F value	P value	F value	P value	F value	P value	F value	P value	F value	P value
playing time/5min(sec)	0.084	0.781	0.758	0.413	1.632	0.242	0.84	0.781	3.279	0.113
playing time Ave./times(sec)	0.124	0.735	2.934	0.13	0.236	0.642	0.124	0.735	0.618	0.458

From this result, factor with difference were condition and color among playtime/5-min. Among playtime Ave., factor with difference was age. When p-value is expanded in less than 0.2, color and condition could be thought a difference as for playtime/5-min. As for playtime Ave., age and color could be thought a difference. Based on this result, testee's reaction was summarized in Tble6-1, 6-2, 6-3,6-4,6-5,6-6.

Table 6-1:

	Sex	
	Male	Female
Playing time Ave./time(sec.)	34.3	18.8

Table 6-2:

	Form		
	Standard	Round	Angle
Playing time Ave./time(sec.)	35.1	33.9	23.9

Table 6-3:

	Age		
	2	3	4
Playing time Ave./time(sec.)	17.4	20.06	48.2

Table 6-4:

	Condition		
	Individual	parent	Group
Playing time/5min.(sec.)	462	446	547

Table 6-5:

	Stability		
	Hard	Normal	Easy
Playing time/5min.(sec.)	294	423	578

Table6-6:

	Color		
	Many	Brown	Beige
Playing time/5min.(sec.)	578	454	423

4 Discussion

4.1 Relationship between the child's play and the building blocks

In this experiment, there were significant relation between the condition and the playing time/5-minutes and between the age and the playing time average/times. Also, there were significant relation between the color and the playing time/5-minutes and between the sex and the playing time average/times.

As for the condition, the various ways of playing were seen with many people. Therefore, if the number of child increases, playing time become longer, too.

As for the stability, the easiness of piling influences playing time. It considered that easy piling building blocks was never got them tired. The average of playing time and all the playtime were used as a independent variable, and characteristics of the building blocks was used as a subordinate variable in the analysis of variance.

As for the sex, boy played more than girl did. There were more opportunities to play with the building block than girls, and boys were used to playing in home. Therefore, the playtime per once becomes longer, too.

As for the shape, while there was popularity in the building block of the universal shape, interest was shown in the building block of the special shape as well. It suggests that though it have relationship between the curiosity and the shape, as well as the simplicity of shape.

As for the age, much time is being spent on one play as much as an age rises. It suggested that play depend on the mental development

Though imaginal playing and composition playing could be observed with any building blocks, the unique play style was not found by building blocks. For example, it can think that the longer play in 3-years children, compare with 2-years children, is a reflection of their mental development (=the sociality). In other words, playing manner differs by the children's age, environment and conditions. This can be understood from the analytical result by the analysis of covariance.

4.2 Child's *Kansei*

It is difficult to know the sign of *Kansei* in children. A child doesn't express emotions only with words. Emotions are expressed by gestures rather than words. It is added that child's mental and physical development varies by each child. Therefore, it is difficult to understand children' *Kansei*.

5 Conclusion

Result of experiment with three different building blocks proved that shape was not the conclusive factor. However the difference in shape and combination are effective in stirring up the child's interest. It was obvious that an external environment element such as condition and age influences child's interest rather than shape. Therefore, it was understood newly that stability and color have relation with children's interest.

It should be the next theme what kind of internal factors enrich child's play more. It found that we must try approach from the sensitivitylike side-*Kansei*-, in meaning to say so, too.

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