

Early Symbolization and Language Acquisition (I)

A case study on early developments in object manipulation and gestural communication

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ABSTRACT

In order to throw light on the early symbol formation and language acquisition of infants, we reported a case study as a part of our larger studies. We observed one Japanese infant named Yuki for over 16 months (4 to 19 months of her age). We speculated the early developments in object manipulation and gestural communication before the emergence of the first word.

We found a parallel development in both domains (object manipulation and gestural communication) in our case of Yuki and that early symbolization developed as Yuki constructed her interactions with both people and objects much conventionally from 7 months. Symbolic function began to have an effect gradually on the child's object manipulation and gestural communication.

And Yuki was an expressive type called by Nelson, K. when she began to utter 50 words. So early symbolization in object manipulation and gestural communication might develop gradually and at roughly the same time in the expressive type children during the prelinguistic period.

1. INTRODUCTION

Children begin to utter meaningful sounds at about the age of 1 year. According to Piaget (1962), symbolic function emerged at the end of the sensorimotor intelligence period. Toward the end of the second year of life, children construct their cognitive structures which are prerequisite for later symbol formation. At the end of the sensorimotor intelligence period, children begin to pretend to feed, to be sleeping, etc. in their play. McCune-Nicolich (1982) remarked that pretend play was a good predictor for early symbolization.

Early symbolization is formed in the process of the interaction with people and objects. Through these dynamic interaction, children develop the ability of symbolizing the external world. As for the interaction with objects, Belsky and Most (1981) described the developmental sequence of objects manipulation in infancy.

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The first levels of developmental sequence are undifferentiated or not defined by properties of the objects. The second levels of object manipulation are functional and functional relational. For example, dialing a toy telephone is the functional play. And placing a spoon in a cup is the functional relational play. The third levels are the emergence of pretense. Before the emergence of pretend play, children manipulate objects in approximate form and use them conventionally. Belsky and Most call those behaviors enactive naming. The first word emerges parallel with the development of enactive naming in the object manipulation (Bates, 1979, Mucunich-Nicolich, 1982).

Recent studies of symbolic function suggest that symbolic development is facilitated by social interaction with people. Infants begin to communicate with people intentionally at about 9 months. And then, reciprocal interaction and exchanging objects with people develop. Through these repeated routine context, children may develop their symbolic world. In Japan, recent research and theory in developmental psychology suggest that the formation of three-component relation (self, objects, people) is the foundation of a child's symbolic function and language acquisition (Koyama, 1985, Yamada, 1987).

Children begin to communicate with people by conventional gestures such as waving bye bye based on the development of three-component relation. Pointing behavior also emerges. We find the differentiation between signified and signifier in it. Pointing behavior is presymbolic because it has little arbitrariness. Gestural communication is also conventionalized as symbolic function develops.

Some researches show prerequisite developments in object manipulation and gestural communication for symbolic development. But how are these developments correlated to early symbolization? There is no adequate answer. We designed a case study on the development of early symbol formation and language acquisition. In this paper, we report the development of a Japanese female infant and speculate on early antecedents to symbolic development from a viewpoint of child's object manipulation and of the gestural communication.

2. METHOD

Subject

Yuki was born in September of 1990. She was a normally developing child. There was no special problem during pregnancy and birth. She began to walk alone at 13 months. She was a first born. Both her parents graduated from university.

Procedures

Yuki were followed from 4 months to 19 months as a part of a larger study of early symbolic development and language acquisition. We observed her once a week in our house. We prepared various toys which would elicit Yuki's symbolic behavior (Fig. 1). Yuki's mother was asked to play with her daughter for thirty

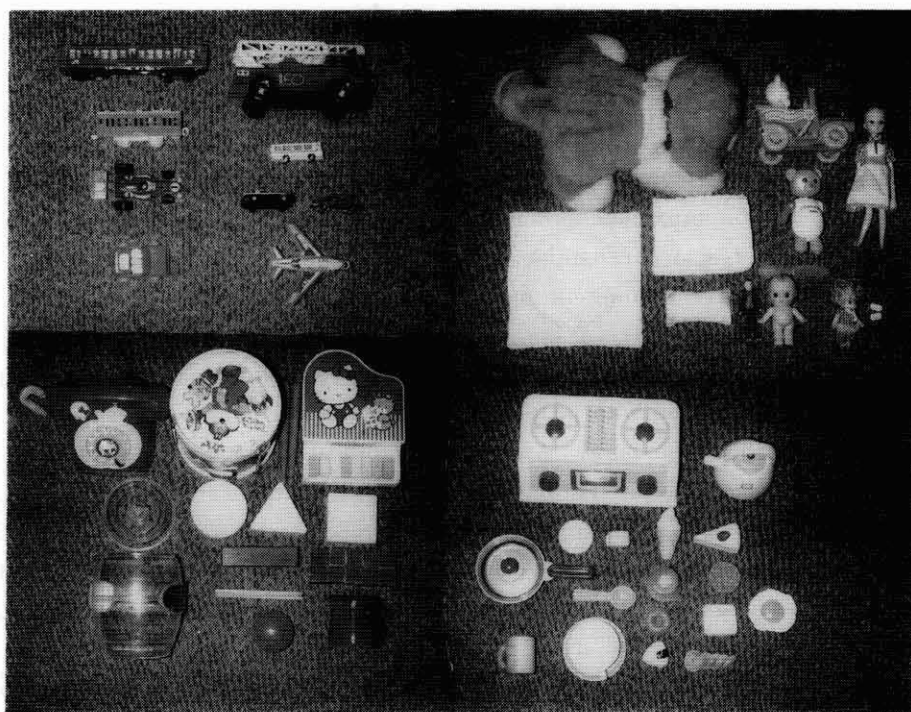


Fig. 1. Toys used for our study.

minutes as she played with Yuki at home. We videotaped their play. And we asked Yuki's mother to keep a diary of the word comprehension and production of her child. We checked her daily records weekly.

Data coding

We made transcripts from videotaped sessions. In this paper, we investigated early antecedent to symbolization in object manipulations and gestural communication. We used the Belsky & Most's (1981) category for object manipulation and use the Bates' (1979) coding for gestural communication. According to those evaluation systems, we evaluated Yuki's behavior in each session before the emergence of the first word.

3. RESULT

The development of object manipulation

Yuki's first word emerged at 10 months of age. Table 1 shows the development of her object manipulation. Mouthing and simple manipulation were present in her object play at 4 months. Functional manipulation emerged in playing the toy telephone. Functional relational play was not observed until 9 months. But Yuki related objects vaguely from 7 months of age. She knocked a toy dish with a toy cup.

Mouthing was still observed at 13 months. Yuki put the toys which were sticks and miniature toy food to her mouth. Cars and dolls were not put into her mouth after 11 months. She recognized which things to be mouthed or not.

After 11 months, Yuki began to relate objects juxtaposingly again. And she began to put miniature toy food to the toy dog. That juxtaposing play after developed conventional and functional related manipulation is prerequisite for later elaborated pretense, especially for object substitutions.

Enactive naming emerged at 10 months of age. First, Yuki named objects enactively. And later she did them verbally. Her verbal naming developed gradually from 13 months. Pretending related to self emerged at 11 months in the play with toy cups. She put a toy cup to her mouth and smacked her lips. In the same session, Yuki put a toy phone to her ear and looked at her mother with her laughing. Also, she tapped a toy piano with her vocalizations. Those behaviors may not be coded as pretend play. Yuki had not experienced to play the piano and to call up others in daily life. Piaget(1962) remarked that the symbolized in the pretend play as telephoning through to say or playing the piano were not child's own activities in their daily life but an imitative one. But recently, children are given to toys such as toy telephones or toy pianos from early infancy. Distinguishing the imitative activities from the pretended one that are children's own activities in daily life is difficult. They construct their symbolic world first by playing with toys and simulating adult activities. And they might apply their symbolic world to the daily life later.

Pretending external developed after the first word emerged. She put the toy cups to the toy dog at 12 months. Yuki began combinatorial symbolic play at 14 months of age. Fig. 2 shows Yuki's pretend external play at 15 months.

The development of communicative gestures

Yuki gazed at actions of her mother at the age of 4 months. Nonritualized request was also observed at 4 months. She gazed at the object that she wanted to grasp and looked at her mothers face after gazing at the objects at 5 months of age.



Fig. 2. Yuki's pretend external play (at 15 months of age).

Table 1. The development of play with objects

levels of play	age	0;4	0;5	0;6	0;7	0;8	0;9	0;10	0;11	1;0	1;1
Mouthing		+	+	+	+	+	+	+	+	+	+
Simple manipulation		+	+	+	+	+	+	+	+	+	+
Functional		-	-	-	+	+	+	+	+	+	+
Juxtapose		-	-	+	+	+	+	+	+	+	+
Functional relational		-	-	-	-	-	+	+	+	+	+
Enactive naming		-	-	-	-	-	-	+	+	+	+
Pretend self		-	-	-	-	-	-	-	+	+	+
Pretend external		-	-	-	-	-	-	-	-	+	+

+ indicates that behavior was observed

Yuki related objects to people vaguely at that age. She looked at her mother with shaking a toy bell. At 6 months of age, nonritualized refusal emerged. And at this age, Yuki could follow pointing gestures to remote objects of her mother (Fig. 3). She began to understand the function of deictic pointing gestures.

Showing toys to her mother emerged from 7 months. Showing was attention-getting behavior. Yuki began to show off to people at 8 months of age. Showing and Showing off are to express self to others. So these behaviors might be related to pretend play. Fig. 3 shows frequency of showing, showing off and pretending from 7 months to 13 months. The mentality reflected in showing was revealed by showing off and pretend play later.

Conventional gestures, pointing gestures and meaningful sounds emerged at 10 months. At this age early symbolization involved gestural communication. We also observed Yuki's giving toys to her mother. Interaction with people by using toys developed at this stage. Nonreferential and referential words also emerged. The first Yuki's nonreferential word was "ai". It was uttered in the context of receiving a object from her mother. And Yuki's first referential word was "oiii" (oishii in Japanese). It means tasty or delicious in English.

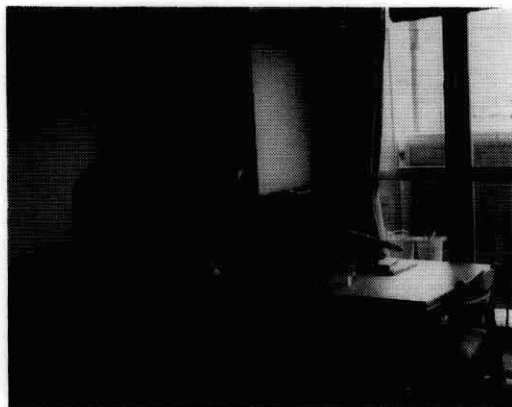


Fig. 3. The comprehension of pointing gesture (at 6 months of age).

Table 2. The development of communicative gestures

communicative means	age	0;4	0;5	0;6	0;7	0;8	0;9	0;10	0;11	1;0	1;1
Nonritualized Request		+	+	+	+	+	—	+	—	—	—
Ritualized Request		—	—	—	—	—	—	—	+	+	+
Nonritualized Refusal		—	—	+	+	+	—	—	—	—	—
Ritualized Refusal		—	—	—	—	—	—	—	—	—	+
Showing		—	—	—	+	—	+	+	+	—	—
Giving		—	—	—	—	—	—	+	+	+	+
Showing off		—	—	—	—	+	—	—	+	+	+
Pointing		—	—	—	—	—	—	+	+	+	+
Babbling		+	+	+	+	+	+	+	+	+	+
Nonreferential Words		—	—	—	—	—	—	+	+	+	+
Referential Words		—	—	—	—	—	—	+	+	+	+

+ indicates that behavior was observed

Table 3. Distribution of 50-word vocabularies of Yuki according to the Nelson's category (1973)

category	%	category	%
Nominal specific:		Modifiers:	
People	6	Attributes	0
Animals	6	States	14
Objects	10	Locatives	4
Total	22	Possessives	0
Nominal general:		Total	18
Objects	16	Personal-social:	
Substances	0	Assertions	6
Animals and people	0	Social-expressives	12
Letters and numbers	4	Total	18
Abstractions	0	Function words:	
Pronouns	4	Question	0
Total	24	Miscellaneous	0
Action words:		Total	0
Demand-descriptive	12		
Notice	6		
Total	18		

Yuki began to organize the events with uttering words from 10 months. She used those words in the interactive context. Checking on the her mother's daily records of Yuki's productive words at 50-word level, Yuki was so called an "expressive type" children according to Nelson(1973). Table 3 shows distribution of Yuki's first 50 words vocabularies in Nelson's category(1973). The problems corresponding to the word acquisition types also need to be investigated in further researches from a point of early symbolization.

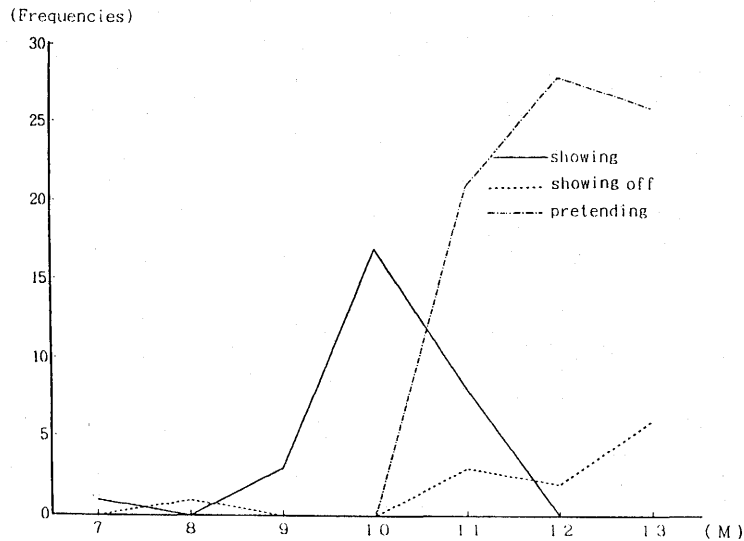


Fig. 4. Frequencies of showing, showing off, pretending in sessions by each month.

4. DISCUSSION

During the months which pretending and the first word emerge, children develop their symbolic world. In this study, we observed one Japanese female infant about her object manipulation and gestural communication. We found the parallel developments in both domains. In Yuki's case, mouthing and simple manipulation in object play correspond to nonritualized request in the communication. At 6 months of age, juxtaposing toys in object manipulation corresponds to nonritualized refusal. The child began to comprehend pointing gestures of her mother at that months of age. And at 7 months, the functional play and the activities related objects vaguely were observed in object play while showing emerged in the development of communication. It shows that infants begin to know the functions of both people and objects from 7 to 9 months.

After 10 months, the child makes her interactions with both people and objects much conventional. At this level, symbolic function begins to have an effect on child's play activities and communicative development. So, the period from 7 months to 9 months of age is a fundamental one for the development of symbolic function. Conventional object use develops in parallel with the extension of the relating objects and relating objects to people. And in gestural communication, pointing behavior and giving objects to others emerge. Showing self by using objects also develops. Showing objects is an attention-getting behavior in origin. It gradually extends to enacting plays with people at this level. Showing off and pretend play develop. Thus, playful joint activity with people might facilitate the mentality of the child reflected in these behaviors.

Actions both in objects manipulation and in communication are convention-

alized gradually. Actions toward people and objects should be detached from practical actions. The action in bye-bye may develop first in emotional and practical context. Children use this action later with her communicative intent (Yamada, 1992). They can develop these gestures in the interaction with people and objects by observational learning and imitating behaviors of adults. In this study, we confirmed that the antecedents to symbolic development consist in both early object manipulation and gestural communication. And both develop gradually in the first year.

Further research is needed to make clear the process of early symbolization from the point of the developmental style, word acquisition style. Yuki was an expressive type as Nelson(1973) called. An expressive type child might develop object manipulation and gestural communication at roughly the same time during the prelinguistic period as observed in our Yuki's case.

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REFERENCES

- [1] Bates, E.: *The Emergence of Symbols: Cognition and communication in infancy*. Academic Press, 1979.
- [2] Belsky, J. & Most, R.K.: From exploration to play: A cross-sectional study of infant free play behavior. *Developmental Psychology*, 17, 630-639, 1981.
- [3] Koyama, T.: A study of the development of prelinguistic behavior in a speech-delayed child. *Japanese Journal of Child and Adolescent Psychiatry*, 26, 328-341, 1985.
- [4] McCune-Nicholich, L.: Play as prelinguistic behavior: Theory, evidence and applications. In McClowry, D.P. et al.(eds), *Infant Communication: Development, Assessment and Intervention*. 55-82, Grune & Stratton, 1982.
- [5] Nelson, K.: Structure and strategy in learning to talk. *Monographs of the Society for Research in Child Development*, No. 149, 1973.
- [6] Piaget, J.: *Play, Dreams and Imitation in Childhood*. Norton, 1962.
- [7] Yamada, Y.: *Speech before Speech*. Shinyosha, Japan, 1987.
- [8] Yamada, Y.: Gesture and self. *Proceedings of the 34th Annual Convention of the Japanese Association of Educational Psychology*, L6, 1992.