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THE EFFECTS OF INSTRUCTION IN THE VALUE OF REHEARSAL STRATEGIES ON THE MEMORY PERFORMANCE OF PRESCHOOLERS

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Training of rehearsal strategy and instruction about its value for serial recall were given to preschool children. For non-spontaneous rehearsers, the rehearsal training resulted in good recall performance. Instruction about its value helped maintain the effects of training. These results confirmed the results of Kennedy & Miller (1976)

Spontaneously rehearsing preschoolers continued to perform well with or without such instruction. The possibility that even preschoolers, once they acquire spontaneous rehearsal strategy, seemed to already understand its value, must be further investigated.

Recently, the development of metamemory, a knowledge about memory, has been investigated in many researchers (Flavell & Wellman, 1977; Kail,1979). The present study focused on metamemory of rehearsal strategy among preschool children.

Flavell, Beach & Chinsky (1966) suggested that the youger children tend not to produce relevant words at the appropriate point in the task situation, and cannot retain the object names that has to remember. This phenomena was called 'production deficiency', and Flavell et al.(1966) suggested production deficiency disappears between the preschool and school years.

Kenney, Cannizzo & Flavell (1967) selected first grade spontaneous Producers and Nonproducers of rehearsal in a serial recall task. On this task, subjects had to recall the serial order of pictures of common objects to which experimenter had pointed.

The Nonproducers were then trained to rehearse the objects' names, and their recall scores becomes as good as that of the Producers.

When given the option to rehearse during three additional trials, Nonproducers abandoned the trained rehearsal strategy, and their recall scores went down.

Kennedy & Miller (1976) thought that one factor affecting spontaneous production of rehearsal may be having a rationale for it use. They also selected first grade Producers and Nonproducers of rehearsal. Their Nonproducers were also given training to verbally rehearse the objects' names, but only half of these Nonproducers were instructed about the effectiveness of rehearsal strategy for memory recall.

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When given the option to rehearse, only those given a rationale persisted in using the strategy and recalled the name of objects as well as Producers. This study suggested that one component of production deficiency is the absence of knowledge that rehearsal is valuable or effective.

In the study of metamemory, it is important to know when and how children acquired such a knowledge. However most research has been concerned about development of metamemory beginning in the schoolage years. The main purpose of present study was to examine the effects of instruction about the value of rehearsal strategy with younger (i.e. preschool) children.

To explore how children acquired such knowledge, this study was concerned with both Nonproducers and Producers. It difficult to ask from preschool Producers how they learned a rehearsal strategy or whether they really know the value of that strategy in a direct interview. So this study examined the effects of instruction about the value of strategy on Producers as well. It was predicted that if they already know the value of rehearsal, there would be no difference between the instruction and noninstruction conditions for Producers.

METHOD

Subjects

One hundred eleven preschool children in Chiba, Japan, served as subjects. Their mean age was 6 years 2 months, with a range of 5 years 8 months to 6 years 7 months. The final sample consisted of 56 subjects who perticipated in both the first and second sessions of the experiment.

Materials and apparatus

Pictures of six common objects (tulip, tricycle,clock,dog,apple and shoes) were arranged in a 3×2 array in random sequences on 24 display cards (Fig. 1).Subjects wore a cup with a goggle during experimental session. The goggle was used in order not to aware lip reading by the experimenter.

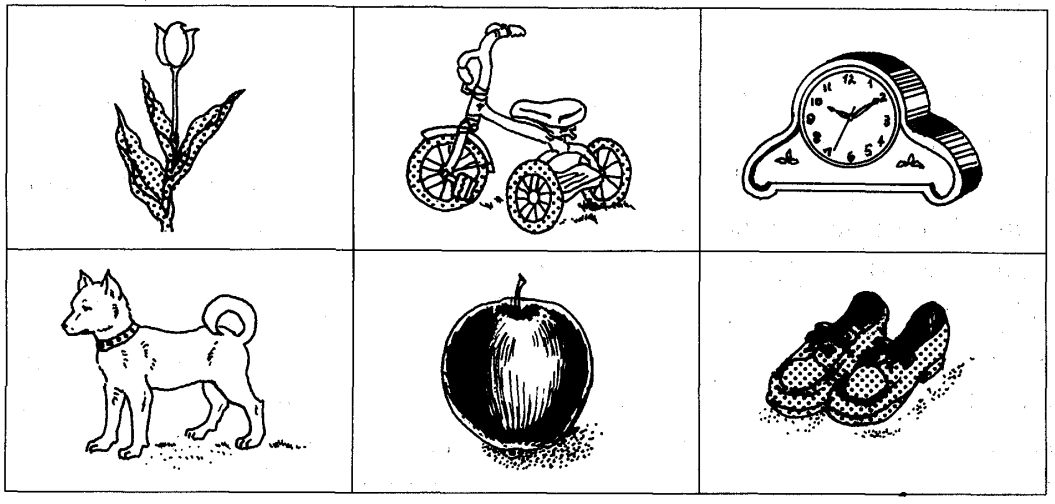

Fig. 1 An Example of a Stimulus Array.

Procedure

Each child was tested individually, with one experimenter administering the tasks and scoring rehearsal (or lip movement) and recall data, and an assistant experimenter scored response time.

Session 1. First, brief training was given on the concept of 'same order' using colored paper cards. Following this training, the child was instructed on the use of the goggle using picture materials. The child was instructed to look at each picture as the experimenter pointed to it, and then wear the goggle. During a 15 second interval while the child wore the goggle, another stimulus array was substituted.

The child then took off the goggle and was told to point the same sequence of the pictures regardless of the new spatial locations of the items. Following Kenney et al. (1967) and Kennedy & Miller (1976), the number of items in the 10 subsequent trials was 5-4-3-4-5-3-2-3-4-5.

Children were designated as Producers if they were seen to rehearse or move their lips on nine or ten of the 10 test trials during 15 second intervals while wearing the goggles. Those who rehearsed on one or none were categorised as Nonproducers. The subjects classified as either Producers or Nonproducers were participated in session 2 which held one week later.

Session 2. The Producers and Nonproducers were paired on the basis of their recall score on session 1 and then randomly assigned to Producer-Instruction (P-I), Producer-Noninstruction (P-NI), Nonproducer-Instruction (N-I), and Nonproducer-Noninstruction (N-NI).

All subjects were given the same 10 trial serial recall task and told to name each picture to which the experimenter pointed. Then they wore the goggle and whispered the names of the pictures repeatedly during 15 second intervals of the first seven trials.

Before the last 3 trials, subjects were told,"I'm not going to tell you to say the names I pointed over and over again any more while you play the game. You can say them if you want to, but you don't have to ". Following this instruction, all subjects were tested last 3 trials.

At the beggining of session 2, both the instruction groups (P-I and N-I) were told, "I guess whispering the picture name helped you remember the pictures better".

On the 10 test trials of each session, the number of correct recall items, response time and the number of rehearsed trials were scored.

RESULT

Percentage of Producers and Nonproducers.

In original sample, the number of Producers, Nonproducers and Inconsistent Producers were 31 (27.9%), 38 (34.2%), and 42 (37.3%), respectively. This suggested that our subjects (5—6 years olds) were in a period of transition from production deficiency to spontaneous production of rehearsal strategy.

Recall data.

Each 10 test trial was divided into the following three blocks; 1st (trials 1—3) ,2nd (trials 4—6) and 3rd (trials 8—10) block. In order to equalize the number of recall items, trial 7 data were eliminated, so that each block contains 12 items epually.

Session 1. Three way ANOVA for repeated measures (Subjects: P, N x Condition: I, NI x Block: 1,2,3) revealed significant main effects for Subject ($F(1, 55)=9.23$ $p<.005$) . Producers recalled more items than Nonproducers on this session (Fig.2) .

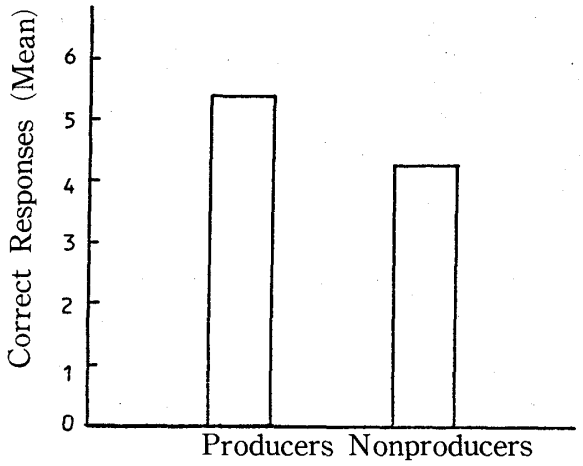

Fig.2 The mean number of correctly-recalled items in session 1.

Session 2. In session 2, trials 1 to 7 were rehearsal training trials and trial 8 to 10 were optional use test trials. Three-way ANOVA showed a significant interaction of subjects x Block ($F(2, 1040)=2.39$, $p<.05$). Further comparison indicated that in the 1st and 2nd blocks there was no such significant effects. It suggests that the rehearsal training, induced in these blocks, was effective and the difference between Producers and Nonproducers, which appered in session 1, disappeared in these blocks.

However, in Block 3, Producers recalled more than Nonproducers ($F(1,52)=4.85$, $p<.05$) . Detail comparison between groups showed only N-NI group significantly less than both Producers groups (P-I vs N-NI: $t(26)=2.04$, $p<.05$; P-NI vs N-NI: $t(26)=2.17$, $p<.05$) (Fig.3).

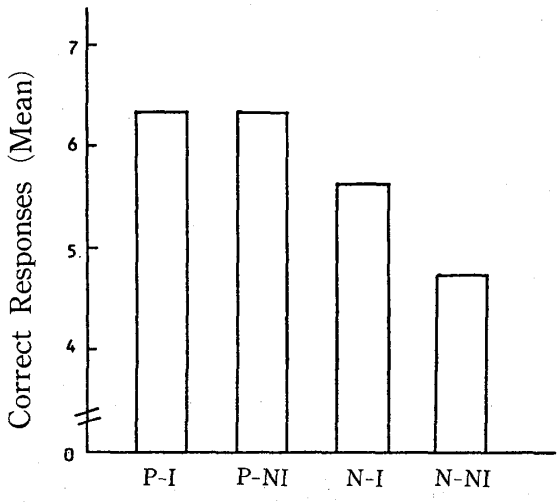

Fig.3 The mean number of correctly-recalled items in block 3 in each group (Session 2).

Percentage of rehearsers.

Table 1 shows the number of rehearsers in each group on Block 3 of Session 2. In this optional use block, N-NI group abandoned the rehearsal strategy on which they had trained ($X^2(1)=13.01$, $p<.001$, Fig.4). This suggests that correct performance was related to the use of rehearsal strategies.

Response time.

There were no significant differences of response time between any conditions.

Table 1

Numbers of subjects who rehearsed on Block 3 (Session 2)

	Number of Rehearsers			
	0	1	2	3
P-I	0	0	2	12
P-NI	1	0	1	12
N-I	0	2	5	7
N-NI	5	2	5	2

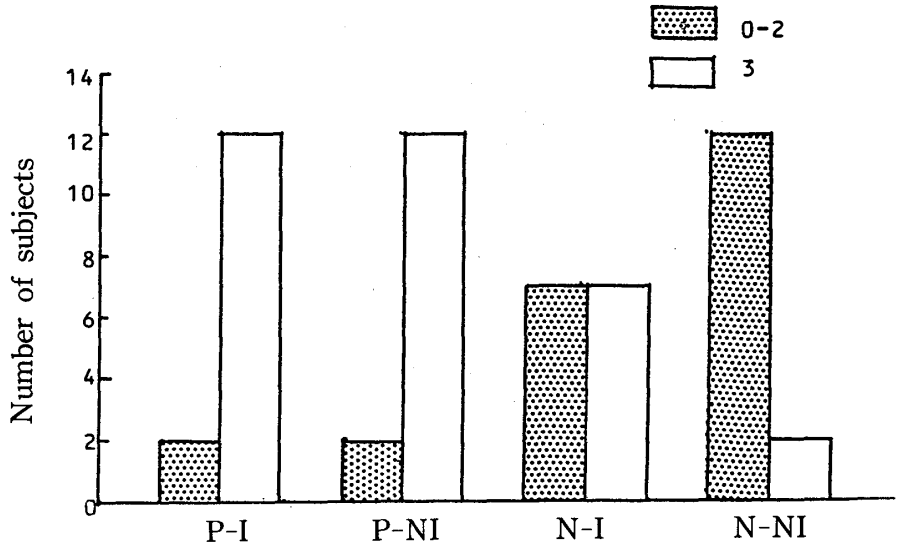

Fig.4 Numbers of subjects who rehearsed on block 3 (Session 2).

DISCUSSION

The results of the present study suggested that persistent use of a newly acquired rehearsal strategy may be facilitated by instruction about its merit among Nonproducing preschool children. However, Producers were constantly good performers with or without such instruction.

The results of Nonproducers were consist with Kennedy & Miller (1976). It is said one reason of production deficiency of rehearsal strategy may be the absence of

the knowledge about the value of rehearsing.

The fact that instruction as to the usefullness of rehearsal strategies had no effects on the Producers suggests that once acquired, voluntary rehearsal strategies are used persistently among preschool children. The Producers already knew its merit from past experience. However, if the Producers used rehearsal only customary, they would have recalled many items even without the knowledge of its value as did Nonproducers at training trials.

Thus it is impossible to determine whether they rehearsed because they really know its value or not from the present study.

Further study is need to examine the cause of such spontaneous strategy use. In such research, examination of difference of various characteristics, such as verbal ability, cognitive ability etc., between these Producers and Nonproducers will be important.

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