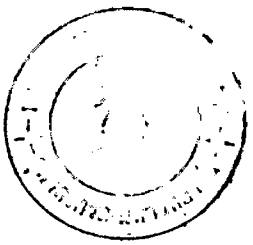
Chapter II

Methods and Procedure



The subjects in this study were one hundred students: eighty children were randomly selected from various schools and twenty adults from a university. Of the eighty students, twenty subjects 4 - 5 years of age were from a kindergarten; twenty subjects 7 - 8 years of age and 10 - 11 years of age were from a primary school; twenty subjects 14 - 15 years of age were from a secondary school and twenty adults 20 - 21 years old were volunteer students from a university. All these subjects were divided into five groups by age level and each group had ten males and ten females. The characteristics of the subjects are presented in Table I

Table I Partially Urban Subjects

Level of Education	Group Age Range	Number	Mean Age	Education Mean Years.
Kindergaten	4 - 5	20	5.07	1
Elementary School	7 - 8	20	7.24	3
	10 - 11	20	10.40	6
Secondary school	14 - 15	20	14.47	9
University	20 - 21	20	20.41	15

The Kindergarten, the Elementary school and the Secondary School were co-educational and government schools. Teaching in all schoos was done in central Thai language. Subjects spoke Isarn at home. The testing was conducted in Isarn dialect. A description of the provincial town in which the present study was conducted is provided in Appendix F.

Stimuli and Test Matenials.

Test materials which were described by Wagner,[1] were adapted from Hagen.[2] The stimuli consisted of a set of seven white stimulus cards (see Appendix A). Each card was one and a half inches wide and three inches long. Two pictures, one objects and one animal were pasted on one side of each card. The pictures were pasted, one above the other; three with the animals above and four with the animals below. These pictures of objects and animals were taken from children's books. Each animal was paired with one object: dog-motorcycle, shirt-cat, pig-shorts, turtle-airplane, tree-elephant, house-fish, hat-duck. Pretests had been conducted to determine that these particular pictures were generally recognizable to the subjects at all ages. There were fourteen sets of the seven stimulus cards and all sets

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[1] Wagner, loc. cit.

[2] Hagen, loc. cit.

were constructed and arranged in a fixed randomized order. Each set had its own separate test packet. Included were two large index cards, four inches wide and six inches long; one card contained all seven animal pictures in a circular design and the other card contained the pictures of the objects. These cards were used for pretest stimuli prior to the central task to test whether the subjects recognized all the pictures. For the cue stimuli in the incidental memory task, there were two sets of seven cards; one set consisted of single objects and the other consisted of animals.

For the practice session, an equivalent but smaller set of different stimuli were used. Each set consisted of three animals and three objects. Each animal was paired with one object; e.g. bird-chair, car-horse, skirt-crab. A white cloth was used as the testing surface, and it was placed on table or desk top.

Procedure

Procedure in this study was adapted from Wagner.[3] The subjects were tested individually in an unused

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[3] Wagner, loc. cit.

classroom. All subjects were tested for central and incidental memory with the same task stimuli. The materials were balanced in such a way that animals were central and objects were incidental for half the subjects, and the reverse for the rest of the subjects.

The central task consisted of locating a particular central stimulus among a series of seven that were presented briefly to the subjects, and then placed face down infront of the subjects. On the completion of the central task each subject was tested for incidental memory by being asked to recognize which animals (objects) went with which objects (animals) on the basis of information from the previously shown animal-object pairing in the central task.

The experimenter and the subject sat face to face on opposite sides of the table or desk. The first part of the test situation was the practice trials using Isarn dialect to communicate with the subjects. The second part was the real trial to test central and incidental memory. After the testing, each subject was asked to give background information about himself and about details of both level of education, number of people in the household, name of hometown, and education level and income of parents. For the younger children the

background information was obtained from their parents or teacher.

Direction for Testing

> Directions for testing were adapted from Wagner.[4] "Now, we are going to play a game. Before playing the real game, let's play a practice game to know that you understand the game. Do you know these three animals and these three objects? Name them."

When the subjects named the animals and objects the experimenter repeated their words. The objects are; "skirt, car, chair," The animals are; "crab, horse, bird."

> "Now, the idea of these game is to remember where each of these animals (or objects) is, as I place them down in front of you. Then I am going to show you an animal (object) and you must point out, but not turn up the card where that animal is in the row. I will then tell you whether you were correct or not, and I will prove it by showing you where the animal (object) is located. Remember it is necessary to remember only where the animals (objects) are. The objects (animals) are not important."

The experimenter then went through six trials with the practice game. The experimenter explained if necessary what was meant by "animal" or "object." If the

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[4] Wagner, loc. cit.

subject got three or more correct responses, the experimenter proceeded to the central task. If the subject made fewer than three correct responses, he was dropped from the experiment. For the present study four out of twentyfour subjects at age 4 - 5 were dropped from the research because they did not meet the above criteria.

For the real test seseion, the directions were as follows.

> "Now you understand the idea of the game. Let's play the real game. It has the same idea as the practice game, but the animals and objects will be different. Also, there will be seven cards, not just three. Now, I want you to tell me the name of all these animals and objects."

The experimenter repeated.

> "The animals are, turtle, fish, duck, elephant, cat, dog and pig. The objects are, hat, tree, shorts, motor-cycle, airplane, house, skirt." Now you know all the animals and objects. In the real game, as in the practice game, you must only remember where the animals (objects) are. Also, to make the game more interesting for you, I am going to give you a piece of candy for each correct answer, Do you understand everything?"

Responses in either central Thai or Isarn were accepted. Presentation proceeded in a row from the

subject's left to his right. The experimenter held each card in view for approximately two seconds and then placed it face down.

> "Tell me where,_____ (name of animal or object) is. Point it out and I will turn it and show you whether you are right or wrong. Good, you are right, here is your candy. Then, let's go on playing the game."

Each subject was tested on central memory for fourteen test trials. The stimulus cards were presented in a random order. So each stimulus (animal or object) and each serial position was tested twice, but in a different serial position for each time. After completion of the fourteen central task trials, the experimenter began the incidental memory task as follows:

> "Good, now the game is going to change. Do you remember that each card had an animal and an object on it? I want you to tell me which of these objects (animals) was accompanied by this animal (object). Do as well as you can. I will tell you the correct answers. And after we have finished the game, I will give you a piece of candy for each correct answer."

The experimenter tested the subject on all seven objects (animals). The material used for the testing and forms for recording the subject responses on

central and incidental memory scores are presented in Appendix A.

Scoring Procedure

Central Scores: The scores for performance on the central task were defined as

a. The total number of animals (objects) correctly located on the fourteen trials, and

b. number of correct answer for each serial position for each age group.

Incidental Scores: Performance on the incidental memory task was defined as the number of correct pairings out of the seven possible pairs.

Statistical Method

1. Means, standard deviation and proportion correct were calculated on the central scores and incidental scores for each age group.

2. A two way analysis of variance was performed to examine differences among age groups and among serial positions and their interaction.

3. Nine separate one way analysis of variance were computed to examine differences on central task scores within each of the age groups, within each of the three serial positions and on incidental memory scores as well.

4. T test comparison were made for central scores to compare the performance between age groups and between serial positions. T test comparison for central scores were also computed to compare between primacy effect and recency effect, between primacy effect and middle-position and between recency effect and middle-position effect for all age groups combined. Lastly t test comparison were made between males and females for central memory scores and incidental memory scores as well to compare sex differences.

5. Correlation was calculated on central task scores and incidental task scores for all age groups to examine the relationship between central and incidental memory performance.