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ABSTRACT

This is a report on an experimental study of a cognitive curriculum supplement developed for the I.V.Y. (Involving the Very Young) Program of the Baltimore City School System. The study concerns the development and transmission of a curriculum for two-year-old children, and an evaluation of its effects. The present version of the curriculum is not a complete one, but a cognitively oriented supplement which seeks to teach the most adaptive style by which representational skills might be used by the two-year-old subjects. Evaluation utilized a design in which 16 preschool centers were paired on a number of relevant variables and randomly assigned to experimental and control groups. Implications of the study are relevant to the general problems of teacher training for preschool programs, the transmission of curricula, and the utility of preschool programs in changing the social and cognitive development of young children. Nine lesson plans are included, as well as the checklists and test batteries used in the evaluation. (Author/ED)

The evaluation of a style-oriented cognitive curriculum for two- and three-year-olds in the I.V.Y. Program of the Baltimore City Public Schools

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August 1, 1973

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Introduction

The following is a report on an experimental study of a cognitive curriculum developed for the I.V.Y. (Involving the Very Young) Program of the Baltimore City School System. The study to be reported concerns the development and transmission of the curriculum and an evaluation of its effects. The primary target of the curriculum was the youngest children in the centers who were two years old. Many of the materials used were first developed by Sigel, Secrist, & Forman (1972) and have been modified by the present investigator for use in the I.V.Y. Program. The present version of the curriculum is not a complete curriculum, but a cognitively oriented supplement for the on-going I.V.Y. Program.

Evaluation utilized a design in which 16 preschool centers were paired on a number of relevant variables and randomly assigned to experimental and control groups. Implications of the work are relevant to the general problem of teacher training for preschool programs, the transmission of curricula, and the utility of preschool programs in changing the behavior of young children. In addition, the curriculum package can be used in future years with the I.V.Y. Program and other programs for young children.

Rationale

Social scientists continue to seek empirical justification for their faith in the utility of early education. From the earliest evaluations of Head Start and other programs for the young child to the most recent reports, the findings have been discouraging. Experimental programs with unit costs so high that they would never be economically feasible on a large scale still produce only minimal changes in intellectual functions or produce gains that fade in one or two years (Weikart, 1972; Karnes, 1973). Generally, long term IQ gains for intervention programs are equal to the gains that can be achieved by simply retesting subjects (Klaus & Gray, 1968; Campbell & Frey, 1970). This bleak picture had led some to despair and others to a position of genetic predeterminism with regard to intellectual performance.

The purpose of this introduction is to develop a theme suggested by Zimiles (1970) in a paper entitled, "Has evaluation failed compensatory education?". The thesis is that the notions and measurements of intellectual performance which have served as a basis for evaluation of compensatory education are altogether too restricted to provide a valid test of the programs. Whether or not compensatory education has utility cannot be determined from the data which are available at present. It is possible that the measures selected as criterial of success are either unlikely to show changes induced by intervention or are of behaviors which all children will demonstrate in time--making the well-replicated "fade-out" effect inevitable.

To discuss children's performance in a fashion sufficiently complex to demonstrate the effects of educational intervention, at least three features of intellectual functioning must be considered. These features might be tentatively labeled structure, power, and style.

Structure: Through Piaget's work on operational intelligence and Chomsky's analysis of language, there has been a resurgence of interest in a set of basic relations which make up the structure of the human mind. These may be presumed to be universal and can be found in the mental acts of any normal member of the human species. These structures can also be considered innate--not in the sense of being present at birth--but in the sense of being species-specific human behaviors which develop in similar fashion for all children. Thus, notions of self, objects, seriation, and volume may be as much a characteristic of the human species as bipedalism. There is little evidence that environmental variation within the limits that will support human life has any effect on the fundamental nature of these structures. This, of course, does not mean that human behavior develops in a vacuum, but that mental structure is environmentally nonlabile.

Power: A second feature of human intellectual performance is power. This factor, which is usually referred to as intelligence, can be measured reasonably well by IQ tests and refers to individual differences in intellectual functioning. Many studies have shown that intelligence or power is one of the most stable characteristics of individuals over time after the age of about three (Bloom, 1964). These findings suggest that power is not particularly susceptible to modification, and many investigators believe that it is controlled primarily by genetic factors. Unfortunately, programs for young children have frequently taken the modification of intelligence as their major goal. It shall be argued below that the IQ gains observed in intervention programs are most likely artif[illegible] of the nature of the IQ test, and that an increase in tested IQ at any particular point in time is not a self-evident good.

The factors which are called structure and power are not viewed simply as two alternative ways of looking at the same problem. Rather, these are two fundamental aspects of human behavior which exist above and beyond the means by which they are measured. To use the terminology in which the problem is currently being framed, the Piagetian and psychometric approaches to intelligence cannot be reduced to a set of common terms because they deal with two fundamentally different aspects of human nature. Moreover, current attempts to use Piagetian tasks as measures of intelligence are predestined to failure. The major difference between Piagetian tasks as test items and traditional IQ test items is that the Piagetian tasks contribute variance only in a very narrow age range.

The reason for this digression into the nature of human thought is to point out the relation of the major ways of looking at intelligence to the problem of educational intervention. The structures of intelligence are common to all normal humans and are unlikely to show the effects of altered experience. When such effects do occur, they will be in the nature of acceleration. Unfortunately since all children will acquire these abilities within a short time, the relative advantage of experimental subjects over controls will necessarily disappear. The situation is similar for intelligence as measured by IQ tests. This form of intelligence is a very poor candidate for modification. It is possible to modify IQ test scores in the short run, but as the content of the test changes a "fade-out" is inevitable. The two major approaches to intelligence are thus simply unsuited to measuring the effect of preschool intervention.

Style: To discover the aspects of intellectual performance which appear more directly relevant to the adaptability of individuals, we must consider a poorly defined range of activity which might be called style. Two individuals who by virtue of their human status have identical intellectual structures and who have similar IQ's may still respond in radically different ways when faced with the same problem. To the extent that their way of responding is a relatively enduring characteristic of their intellectual performance, it may be considered their style. Style cannot be considered independent of structure and power, but represents how these two underlying factors are used.

The justification for the curriculum which follows is the assumption that stylistic variables are critical in determining individuals' success in school and work and that style is determined to a great extent by social experience. The two components of style which appear critically important for educational success are the effective use of language to escape the limits of the immediate situation and the adoption of a reflective attitude when faced with a problem. It should be noted that the aspects of cognitive functioning which are stressed in the program are particularly social in nature. Therefore it is possible that the program might have favorable effects on children's social as well as intellectual development.

In order to investigate the proposition that adaptive style could be fostered in a preschool context, the present investigator instituted an experimental curriculum in the Fall of 1972. The project was designed to bring a curriculum developed by Professor Irving Sigel of the State Unviersity of New York at Buffalo (cf. Sigel, Secrist, & Forman, 1973) to the Baltimore City I.V.Y. nursery schools.

The major target group of the program was two-year-olds, since it was assumed that the third year of life is critical for the development of communication habits as much of language is learned during this period. The Sigel program, which the investigator found extremely compatible with the ideas outlined above, was based upon what Sigel called the "distancing hypothesis." By this term Sigel implied teaching the child to use representational abilities (memory, language) to free himself from the limits of the immediate situation. Sigel assumed, as does the present writer, that there was no need to teach the representational skills required to perform cognitive tasks, but only the most adaptive style with which those skills might be used.

The Curriculum

Although the investigator's original intention was to take material directly from Sigel, it became immediately apparent that the Sigel curriculum had not been developed to the point that allowed direct dissemination. Available material consisted of general guidelines and a few examples. The state of Sigel's curriculum as of September, 1972, underscored the practical problems about curricula in general that greatly reduce the effectiveness of many experimentally produced programs. Sigel's curriculum had been transmitted to his teachers through on-the-job training which employed several Ph.D.'s and graduate students. Because of this favorable situation, the program was not put into a detailed written form. Thus, the mode of transmission employed by Sigel appeared to be economically unfeasible in a large-scale effort such as the I.V.Y. Program.

Bearing these considerations in mind, several restrictions were self-imposed by the present investigator in order to maximize the present and future utility of the curriculum transmitted to the I.V.Y. nursery schools. It was decided that the curriculum must be developed in a detailed written version and that it must be transmittable to teachers with varying educational backgrounds with a minimum of outside professional supervision. The curriculum had to complement the existing I.V.Y. Program without disrupting or supplanting it and could require only minimum expenditures for supplies and equipment. Essentially, the program was planned as a curriculum that could be added to an on-going program and which could continue with no outside support and with no additional costs after the research phases of the program were over. The importance of these self-imposed restrictions must be stressed. They make the present task more difficult, but increase the prospects that the finished product will be practically feasible.

To meet the demands of a written program and effective transmission, a series of detailed lesson plans was developed. The lesson plans thus became both the written curriculum and the vehicle for training teachers. Direct interaction between the research team and teachers was limited to one hour bi-weekly meetings and visits to the nursery schools. When visiting the schools, the research team assumed a supervisory role, not a direct teaching role. The visits were designed to afford the opportunity to interact with the teachers on a more individual basis, to answer questions, to discuss problems, etc.

Although the method of teacher training will be discussed in more detail below, it should be noted here that the strategy for teacher training was to move from specific to general rather than in the opposite direction. The teachers received concrete instruction in what they were supposed to do in the form of lesson plans. Each lesson plan was discussed during the meeting at which it was presented, but no attempt was made to deal with the theory behind the curriculum until January. At that time a written description of the conceptual orientation of the program was distributed to the teachers and discussed. This strategy of moving from the specific to the general was based upon the notion that the teachers should "discover" the principles behind the exercises in the same way that children discover concepts in the nursery. This writer has argued elsewhere that this is the most effective way for any learning to occur (Webb, 1972).

A series of nine lesson plans was distributed to the teachers over the course of the year and is presented below. Each lesson plan designated the materials needed for the lesson, the time of the morning it was to be employed, the cognitive objectives for the lesson, and the specific instructions for carrying out the lesson. It should be noted that each lesson plan has two levels of content. The first is specific to a particular lesson and is described as the "cognitive objectives" for that lesson. The second is more general, is implied in all of the lessons, and embodies the "style of interaction" which the curriculum was designed to foster. This second level of content consists of the teacher's interaction with the child; the child is called upon to think about what he is doing, to remember previous events and anticipate future ones, and to verbalize what is going on and what he is thinking--in short, to "distance" himself from the immediate situation and reflect upon the relationships inherent in it.

It must be emphasized that the basic notion in all of the lesson plans is this particular style of teacher-child interaction which is essential to the project. In the later, more elaborative, phase of teacher training, the teachers were encouraged to extend the style of interaction implicit in the lesson plans to <u>all</u> of their interaction with the children. Specific means by which the teachers could foster this adaptive approach to problems even when not engaging in lesson plan activity included emphasizing relations implicit in objects and activities, asking questions which require an elaborated rather than only a one-word or yes/no answer, and encouraging thought and verbalization of certain abstract relations such as cause and effect, before and after, and if/then. The virtue of the lesson plan strategy was that the teachers had concrete experiences with these concepts before they were introduced at an abstract level.

The following is the series of nine lesson plans which were distributed to the teachers from October through March. Included also is the written rationale of the curriculum which, as mentioned above, was distributed to the teachers in January.

1: Lesson Plan for Play Dough

Materials: Flour, water, salt, food coloring, bowl, rolling pin (optional)

Designated Activity Period: Free Play

Cognitive Objectives: Appreciation of sequence, transformation of identity, part-whole correspondence, imitation and pantomime, self-identity, means/ends relationships

Instructions to Teachers:

I. Making Play Dough

Begin by explaining to the children that you will be making play dough, and describe each step to them as you perform the actions. Also, try to involve the children in as many of the actions as possible. For example:

1) "First we need some flour and salt and a bowl." Ask one or two of the children to get the flour and/or the salt and/or the bowl and to bring them back to the work table. If the children you ask do not respond, try walking a few of them to get the materials and let them carry them back to the table.

2) "Now we must put the flour into the bowl." Allow the children to touch and taste the flour if they wish. Comment upon its consistency, its color, whatever. Do the same sort of thing with the salt.

Continue with:

3) Adding food coloring to the water. Note the change in color of the water and point out that it is the same color as someone's clothes or some other object in the room; also, encourage the children to name the color after you and to talk about what they're doing.

4) Mixing the colored water with the flour and salt. Call attention to the new consistency, color, and taste -- again, encourage the children to touch and taste for themselves.

During all of this, keep in mind:

1) Describing each step in the process.
2) Involving the children as much as possible by letting them touch, taste, and smell the play dough, by letting them help you collect and mix the ingredients, and by encouraging them to talk about what they're doing.
3) Asking the children questions that you think they may be able to handle. Don't press them if they don't answer, but still keep talking and encouraging them, singularly or collectively, to respond.

In the following days, ask the children to anticipate each step in the process before it happens. (For example: "Who knows what we need to make play dough?" "What do we do after we put the flour into the bowl?") Again, encourage participation in the process of making the dough and continue to ask the children questions as you go along. Built upon what they already know -- ask them to tell some things that you told them the first day. Encourage, but don't pressure, them to become more physically and verbally involved in the play dough making process as the days go by.

II. Playing with the Dough

When you pass out the dough for the children to play with, ask: "Now who can tell us how to make play dough? What's the first thing we have to do?" Encourage the children to tell each step in sequence. If they have trouble, give them hints or fill in the missing spots. For example: "Johnny, what did you bring to the table?" "Did we have to add something to the flour and salt for it to turn into play dough?"

At this early stage, let the children play with the dough for a good portion of the time exactly as they please, but talk to them as much as possible about what they're doing, and encourage them to respond to your comments and questions. Here, however, are some beginning exercises that you can perform with the group of children together:

1) Before you pass out the dough to the children, roll all of it into one large ball and emphasize its size to them. Then pass some dough out to each child, calling each child by name ("Here's some play dough for James, here's some for Mary, etc.") Call their attention to the fact that your large ball is becoming smaller and smaller as you pass it out and is finally "all gone." Then ask: "Should we make one big ball again?", and ask each child to give you back his share of dough (calling each child by name as you do), until you have one large mass of dough again. Comment on this to the children, and then distribute the dough to each child again.

2) Make a ball with your share of dough, showing and explaining to the children exactly how you do it. Encourage each child to make a ball with his dough, too -- just the way you do. Comment upon what each child has done, and encourage them to talk about it, too. Throw your ball up in the air, saying: "Let's pretend it's a real ball." Ask them to do the same.

3) Flatten out your dough on the table several times -- first with the palm of your hand, then with the side of your fist, then, possibly with a rolling pin. Explain that you're using all these different ways to do the same thing, that is, to flatten out the dough -- to "make a pancake." Encourage each child to make his own pancake as you do, and talk with the children about all the different ways they can do it.

As the days go by, ask the children questions about what they did the day before: "Did we make balls with our play dough yesterday?" "Did we make pancakes?" "How did we make the pancakes?" Encourage the children to remember and talk about what they did before.

Use your judgment with these exercises. Don't try to cram everything into one sitting if the children can't seem to handle it. Build upon the children's knowledge day by day, and elaborate what you do as the children's grasp of the situation seems to warrant.

2: Lesson Plan for Circle Games

Materials: Phonograph and records

Designated Activity Period: Circle Time or Story Time

Cognitive Objectives: Imitation and pantomime, appreciation of sequence, anticipation and recollection, comparing and contrasting

Instructions to teachers:

IMITATION

Day 1

A. Put music on the phonograph.
B. Have children form a circle holding hands; then drop hands.
C. Ask the children to do what you do:
1) Clap hands to music. Say "Let's clap our hands." (While clapping, say "clap" each time you clap.)
2) Stamp feet to music. Say "Now, let's stamp our feet." (Say "stamp" each time you stamp.)
3) Jump into the middle of the circle. Say "Now, let's jump into the middle of the circle." (Say "jump, jump, jump" as the children jump.)
4) Move back out into the circle holding hands and repeat steps 1, 2, and 3 two more times, always in the same order.

Days 2, 3, 4, etc.

A. Follow the steps for day 1 all the way through one time.
B. Go through the clapping again with the children. Before doing the stamping, say: "Who knows what we do next? Can you show me what we do next?" If the answer is positive, then say: "Yes,we stamp after we clap. Let's stamp." (As you say "stamp," stamp. As you say "clap," clap.) Repeat this procedure before jumping into the middle of the circle. Then repeat the entire sequence again using the verbal instructions for Day 1.

If the children do not know what comes next, say: "First we clap, then we stamp" (Say "clap" as you clap; say "stamp" as you stamp). Ask the question again. "What do we do after we clap?" If there's no answer, verbal or physical, say "We stamp! Let's all stamp." Use this procedure again between stamping and jumping into the middle of the circle ("We jump after we stamp.") Repeat the whole sequence using the verbal instructions for Day 1.

After finishing the circle game for imitation each day, do the following.

PANTOMIME

Day 1

A. Say, "Children, let's pretend that we're elephants today. I'm going to be an elephant and you are going to be an elephant (pointing to a child) and you are going to be an elephant (pointing to another child), etc."

B. "Here's how I walk like an elephant" (Show the children how.) "Can you walk like an elephant?"

C. "Let's swing our trunks. An elephant's trunk is like his nose. It's very, very long." (Talk as much as you can about elephants.)

Day 2

A. "Children, why don't we pretend today that we are birds? I'm going to fly like a bird and you're going to fly like a bird (pointing to a child) and...etc."

B. "Here's how I fly. Can you fly like this?"

C. "Let's flap our wings. A bird's wings are like his arms but they make him fly." (Talk about birds.)

D. "What kind of animal were we yesterday? Do you remember, James? How about you, Mary? Do you remember how that elephant walked? Let's walk like elephants as we did yesterday."

E. "Now let's fly like the birds we were today."

Days 3, 4, etc.

Use new animals each day. Be sure to ask children about the previous day's animal. If you wish, ask them what animal they would like to be tomorrow.

3: Lesson Plan for Macaroni

Materials: a) Several different sized containers (preferably clear)
b) A box of macaroni
c) A table in an area apart from other activities

Designated Activity Period: Free Play

Cognitive Objectives: Sequencing, part-whole correspondence, volume relations, velocity relations, conservation of identity

Instructions to teachers:

Part I

Fill the largest container with macaroni. Distribute the smaller containers to some of the children (all, if possible). Pour the macaroni into the smaller containers until the large container is empty. Point out to the children that the macaroni that was together in the one container is now divided into many smaller containers. Next, ask each of the children to pour their containers of macaroni back into the large container. Show the children how each of the smaller parts combine to make a whole. Ask one of the children to make many different parts again. If they can't, you repeat the process yourself.

Part II

Arrange containers in order of size from the largest to the smallest. Fill the smallest container with macaroni. Pour the macaroni from this container into the next largest. Repeat this all the way up to the largest container. Be sure to point out to the children that each container is less full and that the height of the macaroni in the containers is less and less, even though it is still the same amount. Reverse the process, filling each smaller container by its larger neighbor. Ask the children what will happen when you pour the macaroni back into the smallest container. If they do not know, show them and verbalize what is happening.

An alternative plan is to fill the largest container and show the children what happens when it is poured into the next largest or even the smallest container. Be sure to verbalize what has happened.

Part III

Clear the working area. Fill the smallest container with macaroni. Raise it about 3 inches from the table and pour it out of the container. Ask the children how it sounded as it fell. Then refill the container and raise it 6 inches above the table. Pour the macaroni onto the table noting how much longer it took to reach the table than the previous time. Ask the children if the sound was louder or softer, and whether the flow of macaroni was longer or shorter. Repeat this a few more times using higher heights. Try to use the words: before, after, higher, lower, shorter, longer, louder, softer, same and different as much as possible.

4: Lesson Plan for Story Telling

Materials: Storybooks, any auditory-visual material related to story

Designated Activity Period: Story Time

Cognitive Objectives: Anticipation, recollection, pantomime, representation via pictures, sequence

Instructions to teachers:

Read or tell the same story to the children several days in a row. After one or two readings, encourage the children to remember about the story before you tell it; for example, "What story did we read yesterday?" "Who knows what happened in the beginning of the story?" Pause periodically in your storytelling and ask the children to anticipate what comes next; for example, "What kind of house did the three little pigs make next?" Attempt to draw the children into the telling of the story more and more as the days (designated for a particular story) and, in fact, weeks and months go by.

While telling your stories and asking the children questions about them, always keep in mind what it appears that they actually can handle. Challenge them and encourage them to think about the story and tell you about it, but if they can't answer, especially in the beginning, don't pressure them, and go on with the story. Although it may be difficult to gain the youngest children's participation in the storytelling in the beginning, we hope that, with continual encouragement, they will contribute more and more as time goes by.

After the children become familiar with a story, have them act out the story using props from the classroom or just their own imagination.

5: Lesson Plan for Transportation Vehicles

Materials: Transportation vehicles of various kinds and sizes, blocks of various sizes

Designated Activity Period: Free Play

Cognitive Objectives: Comparison, size relationships, concept of function, relational concepts, velocity relations, recollection

Instructions for teachers:

Gather several of the children into an area which has several cars and trucks. Give a car or truck to each child if possible, keeping one for yourself. Point out the differences between the functions of several of the vehicles. Encourage the children to play with the toys, and verbalize the play using relational terms such as faster, slower, louder, softer, larger, smaller.

If possible, make a ramp out of blocks for the cars. Show how when a car goes down a low ramp it goes more slowly than when it goes down a steep ramp. Make bridges and tunnels with the blocks and show the children how a car goes under or on a bridge and through a tunnel.

On the following days, ask the children questions about the activities. For example, say, "How is a car different from a fire engine?" "Which ramp did the car go faster on?" Continue emphasizing these things, especially with the younger children, until they can answer your questions and generaly talk about what they're doing.

6: Lesson Plan for Housekeeping Corner

Materials: Play stove and kitchen utensils, table and chairs in the housekeeping corner

Designated Activity Period: Free Play

Cognitive Objective: Sequence, anticipation, recollection, part-whole relations, one-to-one correspondence, pantomime

Instructions to teachers:

Cooking

When one or several of the children are in the housekeeping corner, direct their attention to the stove. Illustrate and verbalize the sequence necessary for cooking or baking. For example, say, "First we must put the ingredients in the pot. Then we put the pot on the stove. We stir the ingredients in the pot, and when we are finished cooking, we take the pot off the stove. Remember; the pot is still hot after we take it off the stove. Then we put the __________ (whatever you're making) on a plate to eat. After we eat, we must clean up."

Repeat this sequence from day to day. Try to get the children to think ahead, ask them what comes next, etc. Cook something different each day. Ask the children what they cooked yesterday in school and what they would like to cook tomorrow.

Setting the table

Ask several of the children to help set the table. (If no silverware is available, do this in pantomime or using blocks or whatever you choose.) Be sure to point out that there is one fork, one spoon, one plate,etc., for each person. After the table has been set, pretend to cut a piece of cake for each child. Go through the steps of cutting and serving very slowly, verbalizing them as you go. Be sure to point out that there is also one piece of cake for every plate and one plate for every child. Say, "Here's some cake for James, here's some for Mary, etc."

On subsequent days, ask one of the children to help you cut the imaginary cake. Repeat the process until the children can act it out for themselves.

7: Lesson Plan for Juice-time or Mealtime

Materials: Plates, napkins, cups, silverware, food for juice or meal time, an orange

Designated Activity Period: Mealtime or juice-time

Cognitive Objectives: Sequence, anticipation, recollection, one-to-one correspondence, relational concepts, part/whole relations, comparisons, reversibility

Instructions to teachers:

1. Preparation of the table

Have the children watch while you set the table. Use the same sequence of steps each time (for example, plates first, then cups, then napkins, etc.). Point out that there is one of each item for each child and each teacher. Ask the children what goes on the table next, and what went on before each item you set. After the children have seen this procedure, assign each of them to a particular job (for example, placing cups or putting out napkins). Keep the original sequence intact. Call each child to do his job, and ask the children who they think is supposed to do his job next each time. If the children don't answer, say something like, "Jackie comes next because we put out the cups after we put out the plates."

2. Eating

After the table is set and the children are seated, begin conversation about what they're eating. Encourage the children to compare the shape of their cookies or crackers to other things. Ask them about the color of their juice (or the color of any of their food) and compare this to the color of other things in the room. Discuss the tastes and textures of the food and make comparisons to other foods if this is possible.

Show the children an orange. Talk about its size and shape, comparing it to a ball, etc. Ask the children to smell it. Ask them if the outside is good to eat. Peel the orange and divide it into sections. Note the difference in texture and color. Show the children how the different parts of the orange can be put together again to form a ball. Squeeze out the juice from a section of the orange. Ask the children if you can put the juice back again.

8: Lesson Plan for Matching Animals

Materials: Toy animals, pictures of animals, cards with the animals' names on them

Designated Activity Period: Free Play or Circle Time

Cognitive Objectives: Comparisons, Identity, Representation, Pantomime, and Imitation

Instructions to the teachers:

The general thrust of this lesson is the notion that everything (but in this particular case, animals) can be represented in more than one modality. The real animal itself exists, with certain distinct and definable qualities; it is, however, possible to represent this animal with a three-dimensional toy, with a two-dimensional photograph or drawing, and with a word, spoken and/or printed on paper.

Your basic strategy in conducting this lesson consists in asking the children, singularly or in a group, to match the various representations of a particular animal. This can be undertaken in a variety of ways. For example, show the toy lion to the children and ask them to find the picture that is the same as the toy lion. You can expand upon this by holding up the printed word LION and saying: "This is the word LION; find me the toy lion; find me the picture of the lion." In addition, you can talk about what the lion looks like, and pantomime how a lion walks and roars, asking the children to imitate you. These procedures can be followed for all of the animals (indeed, for any object) for which you have available more than one mode of representation. You can even draw or cut out a paper or felt figure which represents any object in the room and ask the children to match this with the appropriate real object.

This activity should also be conducive to a discussion of the similarities and differences among animals, and you can use the animal pictures for which you have no matching toys for this purpose. For example, hold up a picture of a giraffe and of a tiger and ask the children how these animals are the same and how they're different; you can incorporate imitation and pantomime here also, asking the children to pretend they're giraffes, and then tigers, emphasizing the similarities and differences between the two animals as you do.

9: Lesson Plan for Puppets

Materials: A set of large cardboard puppets, with cut-out faces and hands, of either Community Helpers or Family Members

Designated Activity Period: Free Play

Cognitive Objectives: Role playing, comparisons, anticipation, recollection

Instructions to the teachers:

When introducing the children to the puppets, the first step should consist simply of emphasizing that when they wear the puppets they have a particular name and assume a particular role. So, assign the puppets to a group of children and allow them to look in a mirror. Ask each child who he now is since he is wearing a particular costume. If the child can't answer (for example) "I'm a father," or "I'm a nurse," ask the other children who he is. If they do not answer, then tell them, explaining briefly what a particular character's name is and what it does. For example, "James is a fireman. Firemen ride in big red trucks and put out fires."

After the children seem to have the idea that they have a certain role to play relating to the puppet they're wearing, then ask questions like: "I have a headache--which one of you can help me?" (Doctor or Nurse); "Which one of you sleeps in a crib and cries a lot?" (Baby); "Which one of you rides in a fire truck and puts out fires?" (Fireman). Ask such questions about all of the characters in your particular set of puppets. After the children can respond appropriately to your questions, discuss the various roles even further--ask the children to tell you about the role they play. Perhaps you can even play-act a particular story (for example, a neighborhood incident involving the community helpers, or a mealtime scene with the family members), and have the children actually act out their roles. Many of the children will probably not be able to do this right away, but by starting with the simplest ideas first (that is, a discussion of who the characters are and what they do), hopefully the children will be able to build up to taking an active role in an imaginary situation.

When you want to let a new group of children wear the puppets, this is a good time to build in some anticipation exercises, and to really bring home to the children the idea that it is a particular puppet which defines a child's role. For example, with regard to anticipation, ask the children whose turn it is to be a particular character next: "John's the policeman now--who will be the policeman after John?" "Who will be the mother when Mary's finished?" These kinds of questions will also be useful in emphasizing to the children that it is the wearing of a particular puppet that gives a child a particular role--when a child gives up a puppet, he is also giving up a role. For example, "Jackie is the daughter now--when she gives the daughter puppet to Donna, then Donna will be the daughter."

Curriculum Rationale

When we began working with you, we felt that the best way to introduce you to our experimental project was to give you specific examples of ways to get across to the children the concepts we wanted stressed. Those specific examples we put in the form of lesson plans, with which you are now all familiar. It seems to be appropriate at this point, however, to give you a more general and more complete orientation to our project: to clearly define our goals, to describe our theoretical and conceptual orientation, and to stress your role as teachers in the project.

Our goal in this project is to put certain knowledge and theory about how children develop and learn into practice in a preschool classroom situation. We wish to evaluate our specific "curriculum" ideas with your help, within your classrooms, and through your interaction with the children. Although much laboratory research has been undertaken concerning the process of learning in young children, little is really known about how they can best be taught, in the real classroom situation, with all of its accompanying complexities and problems. It is for this reason that evaluation is so important; we hope to discover, with your help, if our ideas about how young children can best be taught will work, that is, will actually result in the children's learning and developing more than they might have without the input of our ideas.

Now for a discussion of what our ideas are. The Swiss Psychologist Jean Piaget has shown that after the age of two, the child becomes able to make use of mental symbols and words to refer to absent objects; he becomes able to free himself from his immediate situation and comes to think and talk about what he does and experiences. He becomes able to remember the past, anticipate the future, and think about things that are not in his immediate, here-and-now, experience. Although these capabilities appear to develop on their own, they develop through experience, and it is felt that giving the children the opportunity for increased interaction with the objects, people, and situations around them can have a beneficial effect upon the children's use of these capabilities when dealing with their world.

Irving Sigel, a psychologist at the State University of New York at Buffalo, made use of Piaget's insights in his own early childhood education project. Sigel emphasized the encouragement of certain "distancing behaviors," behaviors which enable the child to "step back" from his immediate experience and think about the relationships that exist within it; they include being able to deal with such notions as before and after, less and more, near and far, same and different, and cause and effect. This capacity for "distancing" is also important in the child's developing realization that thoughts can be expressed to other people in words, and that real objects and situations can be expressed pictorially and verbally in books.

We have attempted to incorporate these observations and insights into our education program--more specifically, in our lesson plans. We feel that an emphasis upon "distancing," encouraging the children to really think and talk about what they do, can help them to develop certain strategies of thinking that will enable them to cope more efficiently with all of their experiences and, specifically, with their future school tasks. We believe that early experience with such concepts as we've described will have a beneficial effect upon the children's later learning of such skills as reading, writing, and dealing with numbers--skills that they will be expected to master when they enter school.

Now for a discussion of the importance of your role in this enterprise. We are currently working with 8 centers in the IVY Progra. In the spring, when we will be testing the children, we will be dealing with 16 centers. There are, however, only three of us, and it is physically impossible for us to spend a large amount of time with the teachers or children in any one center. We must confine ourselves to our interaction with you in these semi-monthly meetings, and to visits to individual centers. Although we have resolved to visit your centers more often from now on than we have been able to do these last few months (the initiation of this project has caused as much of an adjustment for us as it has for you), we still will not be able to personally interact with the children to any great extent. That is where you, as teachers, are crucial. We have provided a curriculum based upon our ideas of how young children learn and might best be taught, but it is your interaction with the children that is so important. You, as teachers, have had far more practical experience with preschool children than we have; as such, your skill, suggestions, and criticisms are extremely valuable to this project.

Because of your skill and experience as teachers, we want to allow you some degree of flexibility in your interaction with the children. Although we feel very strongly that the activities we're asking you to stress will benefit the children, we want to allow each of you the freedom to fit them into your program in the way that best suits your particular situation in your classroom. Also, we hope that you will take our guidelines as a model for all of your activity with the children. The concepts contained in the lesson plans we've given you are by no means restricted to those particular lessons. We hope that you will extend those concepts into <u>all</u> of your interactions with the children, building upon what they already know, and asking them questions in such a way as to expand their knowledge. Hopefully, you will be interacting this way with the children during all of the activities of the morning.

In short, although we feel that the theoretical basis of our educational program is sound, its success depends greatly upon those who must put the theoretical insights into practice, namely the teachers. We hope you will do your best to follow our guidelines and to emphasize the concepts we've stressed as much as possible. But we're also relying upon your skill as teachers in interpreting and implementing those guidelines, and also in giving us feedback and criticism.

Design for Evaluation

In order to evaluate both the effectiveness of the lesson plans as teacher training devices and the effects of the program on the children, the schools in the I.V.Y. Program were divided into two groups. Schools were paired on a number of relevant variables including age of the children, ethnic composition, quality of facilities, location, and a rating of teacher quality. After pairing the schools, one member of each pair was randomly assigned to experimental and one to control groups. The curriculum has been introduced only to the experimental group at this time, and full implementation with all of the I.V.Y. schools will not begin before December of 1973.

Thus, because of the nature of the experimental design, the curriculum has been introduced to only half of the children in the I.V.Y. Program at this point. One might reasonably question the wisdom of the decision to use such a design which denies half the children the curriculum. The investigator, however, cannot overstress the crucial nature of the experimental-control split in the evaluation of this curriculum program. Educationalists tend to be philosophically opposed to situations where one group receives special treatment and another does not. The result is a considerable antipathy toward the use of untreated control groups in education studies. Because of this, most educational research tends to be of a pretest-posttest design where changes from one testing to the next are assumed to be indicative of the effects of the program. Taken together, however, these two factors--pretest-posttest comparisons and disregard of control groups--renders much if not most educational research worthless.

The reasons for this harsh conclusion can be stated briefly. If a program is studied in a pretest-posttest design and if significant increases in test scores are found between the testings, there is still no logical basis for attributing the change to the specific program input being evaluated--even if a true change occurred.

First, there is a real possibility that a measured increase from one testing to another is spurious and of no real consequence. This can be due to a number of factors. Often children are selected for intervention programs on the basis of poor test scores. When such selection takes place one expects an increase upon retesting due to regression effects. The second reason one might expect an increase is due to what are generally called rapport effects. It is possible to generate an average IQ gain of five to 10 points simply by retesting the subject. The third factor which tends to render retest effects uninterpretable is the problem of standardization of tests. Test-retest increases are defined, of course, in terms of the performance of the normative groups on which the tests were standardized. Obviously, one expects children to get better at most things as they get older, so to show a positive effect an intervention program must prove that its subjects improved more than one would expect from the norms. Unfortunately, such logic requires that the group receiving treatment be comparable to the normative group for the test and this is generally not true. Children are selected for intervention programs precisely because they are not average. Thus simply using standardized tests with no controls can produce meaningless changes with no adequate basis for interpretation.

If changes on tests are obtained and if the changes may be presumed "real" rather than artifacts of one of the factors outlined above, there is still a problem of whether the intervention program is the cause of the change. Over the time period in which a child is in an intervention program, many things occur, only a fraction of which are attributable to the intervention program. A child might show a remarkable increase in reading ability, for example, as the result of finding a book that he particularly enjoyed. Such improvement would bear little relationship to a reading program the child might be receiving.

The only satisfactory way to ascertain that the intervention program per se has any effect on the children is to compare them with a group of similar children who do not receive the program. Such a group is the control group, and the only way to insure that the groups are equivalent on all relevant factors is through random assignment of children to groups. Where random assignment to experimental and control groups has been employed, there is little basis for arguing that improvement of the experimental group over the control group can be attributed to anything other than the intervention program.

Teacher Evaluation

The general trend in training teachers for preschool intervention programs is to provide them with materials and instruction germane to the theoretical basis of the curriculum. This deductive training strategy assumes that providing preschool teachers with theoretical concepts will enable them to develop appropriate classroom activities.

Bissell's (1973) comparison of Head Start programs addresses itself to this point. She found that those programs which used a deductive teacher training method were extremely difficult to implement. That is, teachers who had merely been given abstract theoretical training were often at a loss to bring the concepts they had learned into the classroom. On the other hand, those programs which gave highly structured lesson plans were implemented quickly and thoroughly. Structured curricula have other benefits besides the ease with which they are implemented. Haith (1972) points out that direct training on a structured curriculum acts as a safeguard against staff variability. In addition, with a structured curriculum and adequate supervision, the educational level of the teachers is not an important factor (Bissell, 1973).

Unfortunately, most of the programs which use inductive strategies of teacher training and, thus, structured curricula, are highly content-oriented. The Bereiter-Englemann program (1966), for example, stresses concrete tasks and skills that the disadvantaged child must master. Kohlberg (1968) mentions several studies which teach the child concepts relevant to mastering a Piagetian stage. Unfortunately, these programs attempt to produce changes in what has been called here "power" and "structure" and long term benefits are suspect for the reasons outlined in the Rationale, above. Fortunately, there is no logically necessary connection between a structured curriculum and an emphasis on content. The present study is an attempt to demonstrate that a highly structured curriculum with the attendant advantages of ease of transmission and implementation can include cognitive strategies and style as well as specific skills.

Thorndike (1906) pointed out that "no matter how carefully one tries to follow the right principles of teaching, no matter how ingeniously one selects and how adroitly one arranges stimuli, it is advisable to test the result of one's effort." Unfortunately, the evaluation of teacher training and curriculum implementation has frequently been an eyeball affair. Haith (1972) points out that unless an evaluation of what is actually transmitted to the children is undertaken, there can be no valid conclusions drawn about what teacher behavior is effecting what child behavior. Therefore, this study has analyzed the teacher's classroom behavior in order to determine whether the input of training has produced the appropriate output in teaching.

Toward the end of the school year, three observers, naive to the specific aims of the project, were trained on a teacher observation checklist derived from the one used by Sigel et al. (1972). A description of the coded categories can be seen in Appendix I. The observers were trained by means of a videotape recording. Codings were made once every 20 seconds, but only the first verbalization made in the initial 10 seconds of the coding interval was recorded.

Visits to the schools were then scheduled. It was pre-arranged that when an experimental school was visited a lesson plan from the curriculum would be done. Teachers were led to believe that coding was being done on the interaction in the classroom, and were not told that it was their behavior that was being observed.

A team of one observer and one research associate visited the schools. Each observer visited both experimental and control schools but was naive to the group to which the schools were assigned. All codings were made during the Free Play period. In an experimental school, four minutes of lesson plan activity were coded initially. When the lesson plan had ended and the teacher had begun a new directed activity, two additional minutes of behavior were coded. Coding times were comparable in the control schools except that the initial coding was done on a teacher directed activity instead of a lesson plan. The second coding was made on a new directed activity. Observers were debriefed upon completion of their work to ascertain that the criterion of blind ovservations was maintained. Interviews with the observers confirmed that they did not know which schools were experimental and which control.

Results

Inter-observer reliability was determined in two ways. First, the mean percentage of agreements between each pair of observers over

16 minutes of coding was calculated for every coding category. For observers 1 and 2, the mean percentage of agreement was 93%; for observers 1 and 3, 95%; for observers 2 and 3, 96%.

Since it was likely that these estimates of reliability were inflated due to the large number of categories left blank for each coding interval, a second, more conservative analysis was done. Only those categories which at least one of the observers had coded for any interval were included. The mean percentage of agreement for observers 1 and 2 was 75%; for observers 1 and 3, 81%; and for observers 2 and 3, 83%. Since one estimate of reliability is conservative and the other liberal, it is assumed that an appropriate estimate of inter-rater reliability lies somewhere between the two.

After the data were collected, an examination of intercorrelations between the 19 coded categories was undertaken. Those items which were both logically and empirically correlated were combined and seven categories emerged:

1) Questions: number of questions asked
2) Brief Responses: number of questions requiring a one-word answer or a motor response
3) Descriptions: number of describe/explain codings and matching codings
4) Complex Processes: number of transformations, name/label/classifies, imitation/pantomime, anticipation, recollection, and elaboration

5) Non-information: number of other codings

6) Classroom Directions: number of directives, corrections, and validations

7) Lack of Verbal Output: number of intervals where there was no verbalization.

Referents were discarded since it became apparent that the type of reference was closely linked to the particular type of activity in which the teacher was engaged.

In order to determine the statistical significance of the teacher observation data, a multivariate analysis of variance was performed. The MANOVA is a technique for determining the statistical significance of the differences between two or more groups using a number of variables simultaneously. This analysis concerns the overall pattern of variables and shows how the individual variables contribute to the multivariate outcome.

A MANOVA was performed with the above seven categories as variables using the four minutes of coded experimental lesson plan activity and the four minutes of coded control group directed activity. The approximate multivariate F based on Wilks-Lambda criterion was 3.98 with 7 and 8 degrees of freedom ($p < .04$). The standardized discriminant function coefficients indicated that the Complex Processes category contributed most heavily to the group differences. The experimental group was shown to be significantly higher on a univariate test of the Complex Processes category with $F(1,14) = 35.84$ ($p < .001$).

The category which contributed secondarily but in a different direction to the overall difference was the Non-information category on which controls exceeded the experimental group ($F(1,14) = 3.09$, $p < .05$). The analyses are presented in Table I, and Figure 1 illustrates the relationship between the two groups.

A second multivariate analysis of variance was performed using the two minutes of coded non-lesson plan activity for the experimental group and the two minutes of codings for the second directed activity in the control group. The multivariate F for the two groups was .847 which with 7 and 8 degrees of freedom is not significant. In addition, none of the univariate analyses done on the individual categories yielded significant differences. The results of these tests can be seen in Table II. Figure 2 shows the relationship across categories for the two groups.

Additional analyses were performed comparing the two experimental coding periods against each other and the two control coding periods against each other. Scores for the experimental non-lesson plan period and for the control group's second directed activity period were doubled so as to make the frequencies comparable to the other codings which covered a time period twice as long.

No significant difference was found between the two experimental coding periods with a multivariate F equal to .95 with 7 and 8 degrees of freedom. The complex processes category, however, remained significant at the .01 level with a univariate F of 9.00 with 1 and 14 degrees of freedom. The results can be seen in Table III.

Table I

Tests of Significance between the Experimental Group Lesson Plan Teacher Observations and the Control Group First Directed Activity Teacher Observations

Multivariate Analysis of Variance Using Wilks Lambda Criterion

Test of Roots	F	DFHYP	DFERR
1 through 1	3.98*	7.00	8.00

Univariate Analysis of Variance

Variable	Mean Square	F(1,14)	Standardized Discriminant Function Coefficients
Questions	18.06	1.73	-0.293
Brief responses	1.00	0.07	-0.060
Descriptions	7.56	0.73	-0.493
Complex processes	361.00	35.84**	1.u89
Non-information	27.56	4.60*	-0.025
Classroom directions	0.25	0.03	-0.503
Lack of verbal output	10.563	3.09	-0.647

(* $p < .05$; ** $p < .001$)

FIGURE 1: The Frequency of Codings for Combined Categories during Experimental Group Lesson Plan and Control Group Directed Activity 1

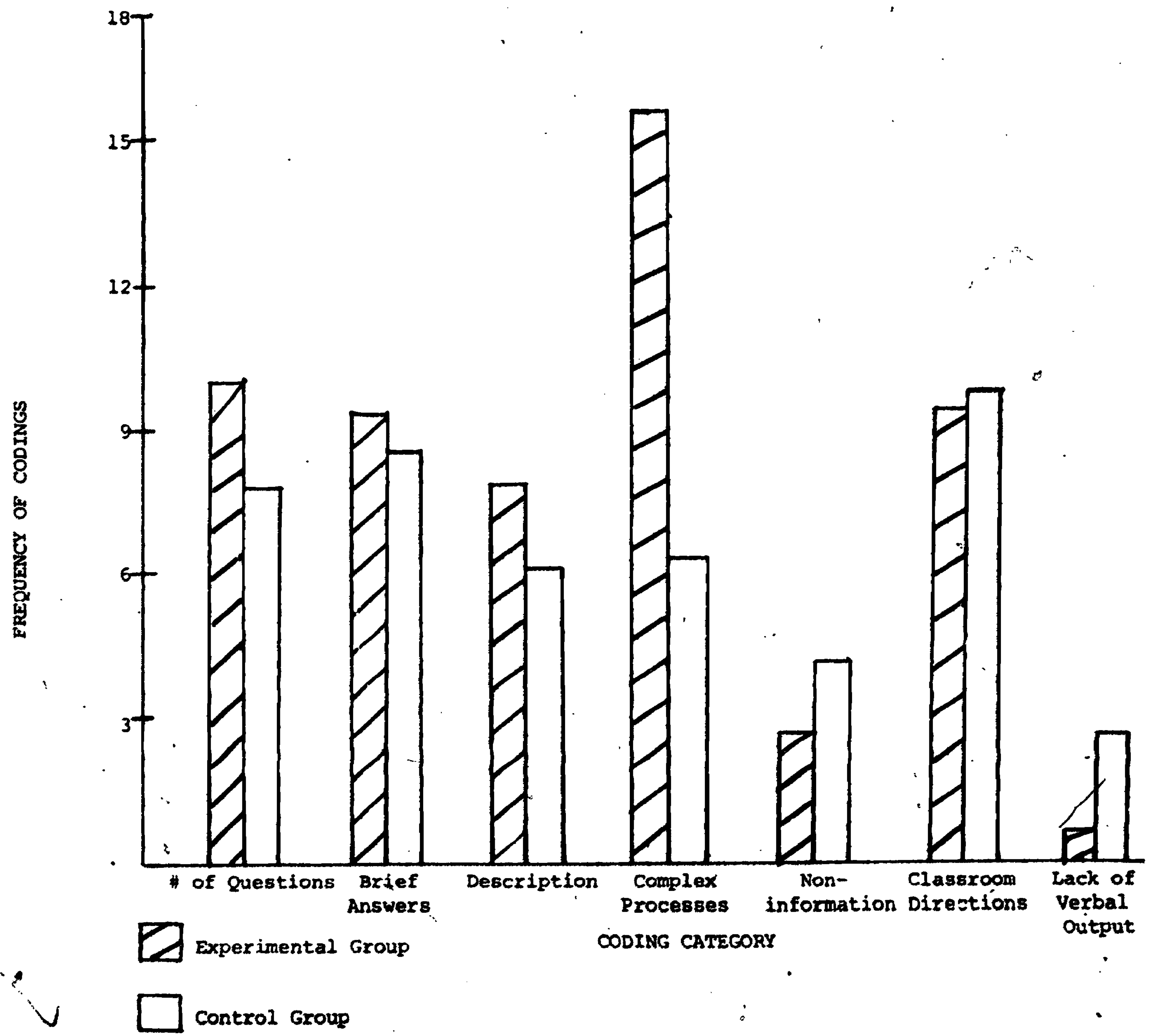

Table II

Tests of Significance between the Experimental Group Non-lesson Plan Teacher Observations and the Control Group Second Directed Activity Teacher Observations

Multivariate Analysis of Variance Using Wilks Lambda Criterion

Tests of roots	F	DFHYP	DFERR
1 through 1	0.85	7.00	8.00

Univariate Analysis of Variance

Variable	Mean Square	F(1,14)	Standardized Discriminant Function Coefficient
Questions	3.06	0.83	0.206
Brief responses	0.25	0.005	0.817
Descriptions	3.06	0.87	0.424
Complex processes	12.25	2.39	1.401
Non-information	1.00	0.52	0.979
Classroom directions	0.00	0.00	-0.058
Lack of verbal output	2.25	0.94	0.434

FIGURE 2: Frequency of Codings for Combined Categories during Experimental Non-lessor Plan Activity and Control Group Directed Activity 2

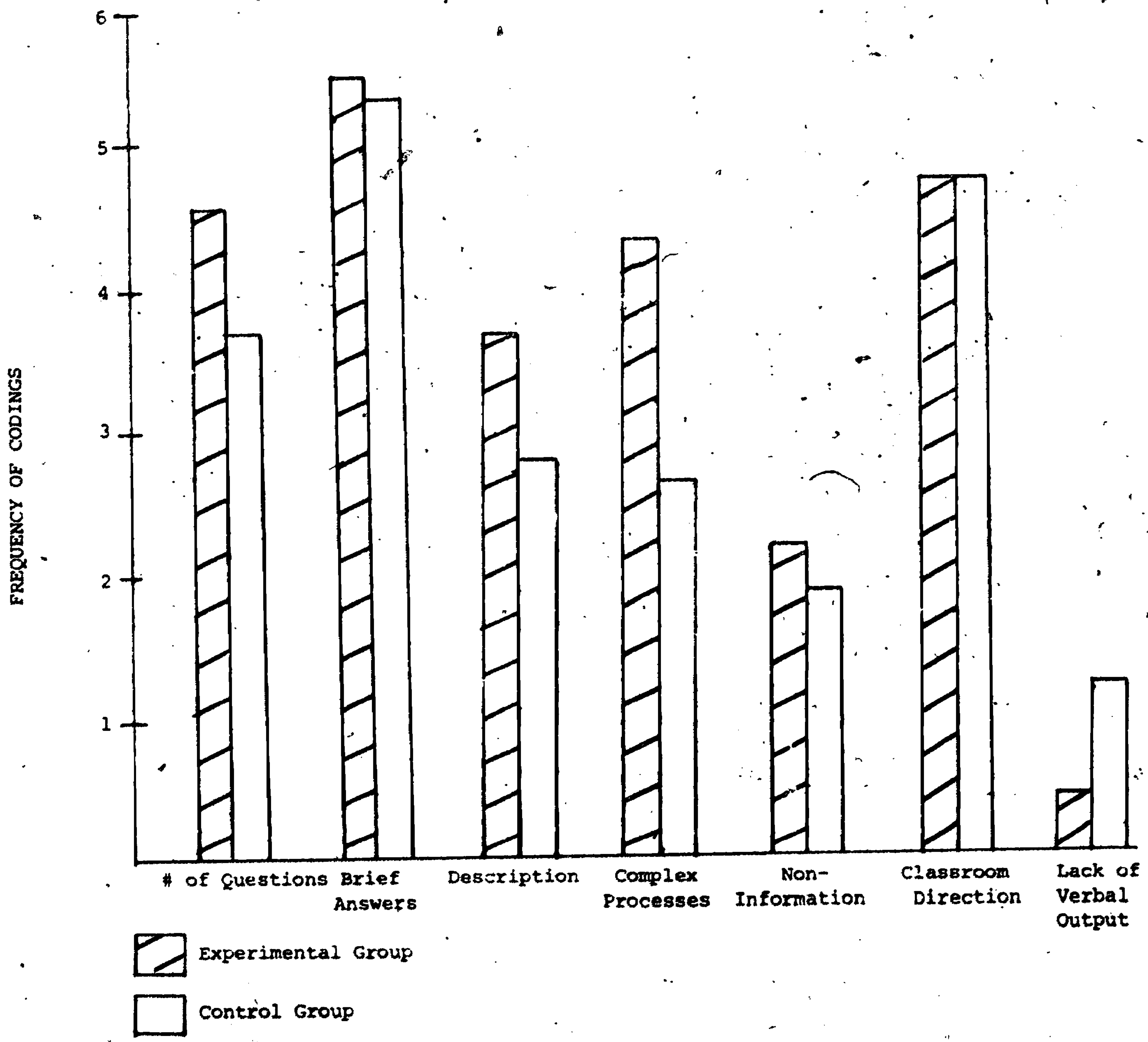

Table III

Tests of Significance between the Two Experimental Group Teacher Observation Samples

Multivariate Analysis of Variance Using Wilks Lambda Criterion

Test of roots	F	DFHYP	DFERR
1 through 1	0.95	7.00	8.00

Univariate Analysis of Variance

Variable	Mean Square	F(1,14)	Standardized Discriminant Function Coefficient
Questions	3.06	0.19	0.136
Brief responses	12.25	0.64	-0.289
Descriptions	2.25	0.13	-0.020
Complex processes	196.00	9.00*	0.767
Non-information	25.00	4.49	-0.433
Classroom directions	0.06	0.01	0.561
Lack of verbal output	1.56	1.10	0.119

(*$p < .01$)

Similarly, there was no significant difference between the two coding periods of the control group with a multivariate F of .679 with 7 and 8 degrees of freedom. In addition, none of the univariate comparisons were statistically significant. The results are shown in Table IV.

Several correlational analyses were conducted comparing various estimates of teacher quality with the teachers scores on Variable 4, Complex Processes. First, a Pearson Product Moment Correlation was calculated, comparing the Complex Processes score with the I.V.Y. project director's overall ranking of the teachers. For the experimental group, r = .51 (df = 6) and for the control group, r =-.45 (df = 6). A second correlation was done comparing the Complex Processes category with the educational level of the teachers. Teachers were divided into three groups: no college degree, college degree, advanced degree. For the experimental group, r = .15 (df = 6); for the control group, r = .48 (df = 6).

Discussion

Since a significant difference was found between the experimental group and the control group when comparing lesson plan activity with directed activity, it can be assumed that the lesson plan technique was effective in training teachers to use certain modes of interaction. The training selectively affected the complex processes behavior and did not differentially affect other teacher behaviors except to decrease the amount of "non-information" behavior in the experimental group. Therefore, it is evident that teaching strategies

Table IV

Tests of Significance between the Two Control Group Teacher Observation Samples

Multivariate Analysis of Variance Using Wilks Lambda Criterion

Test of roots	F	DFHYP	DFERR
1 through 1	0.69	7.00	8.00

Univariate Analysis of Variance

Variable	Mean Square	F(1,14)	Standardized Discriminant Function Coefficient
Questions	1.00	0.11	1.415
Brief responses	12.25	0.90	-1.119
Descriptions	5.06	0.72	0.877
Complex processes	4.00	0.45	-0.353
Non-information	5.06	0.62	1.099
Classroom directions	0.56	0.04	0.966
Lack of verbal output	1.00	0.09	0.727

can be altered without significantly affecting the total amount of verbal output or the grammatical form which the output takes.

Since there was no difference between the experimental group non-lesson plan activity and the control group second directed activity, two conclusions can be drawn. First, it can be assumed that there was no inherent difference in the teaching methods of the two groups. Secondly, it must be concluded that the type of classroom interaction that is generated by the lesson plans did not generalize out of the particular lesson plan activity.

This latter finding has implications for future implementation of the curriculum. In order to broaden the impact of the curriculum, lesson plans for a wider range of activities should be developed. This would ensure that appropriate interaction would cover a larger portion of class time. In addition, generalization to non-lesson plan activities would be more likely since the teachers would be spending more of their time in the desired fashion. It should be noted, however, that a major factor limiting the amount of generalization from the lesson plans might simply be the relatively brief time that the curriculum has been operative up to this point.

The correlational analyses are important for evaluating preschool teacher qualifications. While none of the analyses reach significance, they demonstrate relevant trends. The first analysis suggests that the supervisor's ranking of a teacher correlates positively with the teacher's behavior on Complex Processes in the experimental group. This can be explained in several ways. First, the better teacher could be one who is capable of doing what is expected of her. Alternatively, the better teacher might be more conscientious at learning the lesson plans or at discerning the critical features of the curriculum. This relationship does not hold for the control teachers who show a negative correlation between director's ratings and complex processes score. This suggests that complex process behavior is at a relatively low rate in normal classroom activity and that emission is random.

It is the second correlational analysis which is particularly relevant. The finding that educational level does not correlate with complex process teaching in the experimental group but does correlate with complex process teaching in the control group supports Bissell's (1973) finding that in a structured curriculum the educational level of the teacher is unimportant. As long as there is structure in a program as well as supervision, paraprofessionals can be used as effectively as accredited teachers.

Evaluation of Students

The final test of the effectiveness of any curriculum is the changes it induces in the children who receive it. The evaluation of teacher behavior (above) is critical to determine whether the program has been transmitted, an evaluation of the children is necessary to determine whether the program has had any effect. In testing children in an experimental program, however, it is absolutely critical to remember that it is the program, and not the children, that is being evaluated. The present evaluation program has only marginal significance for determining the overall level of performance of the children in the I.V.Y. Program, and the only question that can be legitimately asked is what do the experimental children know that the controls do not.

There are two fundamental approaches to evaluation which are available in a controlled experiment. One is to use standardized tests and compare the scores to norms. The second approach is to use specific tasks designed to test particular skills and infer change from the experimental-control group differences. The present evaluation uses a combination of the two techniques.

Where standardized items were available they were used. In the present battery these are primarily subtests from the Stanford-Binet Intelligence Scale. In many of the skills that the curriculum is designed to teach, no standardized tests were available and, in these cases, specific test items were taken from Sigel et al. (1972).

It was considered important that the evaluation of the curriculum in its present application be as comparable as possible to Sigel's evaluation, even though the curriculum itself had gone through considerable modifications. Keeping the evaluations comparable would allow us to compare the effects of our program with the intensive, closely supervised, and expensive version used by Sigel. Regardless of whether standardized or nonstandardized tests were used, however, the critical question is always the difference between experimental and control groups.

Below is a brief description of the tests used and their scoring. Testing was carried out by a group of 16 individuals organized into eight teams. Most of the testers were students at The Johns Hopkins University. Testers were trained and supervised by the research team. Prior to any field work there were several meetings to discuss the test material and videotapes of testing sessions were used as instructional aids. Before doing any formal testing, each team of testers was checked for competency in administering the test battery by a member of the research team.

Each team of testers was assigned one experimental and one control school in order to distribute any idiosyncrasies in testing evenly between the groups. Each team was also given a list of the children to be tested in each school. The testing was conducted under blind conditions; the testers were not told whether their schools were experimental or control, nor were they told the goals of the curriculum. After completion of all testing, the teams were debriefed in an attempt to discover if there had been any contamination of the blind conditions.

The testing was carried out during the month of May. It was originally planned that eight children in each of the 16 schools would be tested. This was accomplished in all but three schools; due to factors such as illness, decreased attendance at the end of the school year, and a lack of children available in the appropriate age range, it was possible to test only six children in two of the schools (one experimental and one control) and seven children in a third (experimental).

There was, however, an original discrepancy in the ages of the children tested between the experimental and control groups. Because of an excess of very young children, the control children were on the average approximately two months younger than the experimental children. For this reason, all children under three years of age at the end of the school year (nine control, one experimental) were dropped from the ensuing analysis. This yielded 60 children in the experimental group and 53 in the control group (the age range in each group was from 3 years, 0 months to 4 years, 8 months) who were available and appropriate for analysis.

Description of Measures and Methods of Scoring

A battery of 10 tests measuring perceptual, classification, language, memory and pantomime skills was employed. A condensed description of each of the tests and the methods of scoring will be presented here; the complete testing protocol can be seen in Appendix II. In addition to the test battery a teacher rating of social competency was also obtained for each child tested. The Social Competency Scale used will be described below and appears in Appendix III.

Test Battery

A. Perceptually Oriented Tasks

1. Stanford-Binet three-hole form board (form L-M, year II). The child was required to replace three differently shaped blocks into their appropriate recesses on the form board. This item was scored "1" if the child correctly replaced all three blocks, and "0" if he failed to replace any or all of the blocks.

2. Stanford-Binet three-hole form board, rotated (form L-M, year II-6). Three trials were given in which the child was required to replace the blocks after the form board was rotated from its initial position. A score of "1" was given if the child successfully replaced the blocks on any or all of the trials, and a score of "0" if the child was unsuccessful on all of the trials.

B. Classification Skills

1. Identity matching. Two tasks were given; in each, the child was given a block of a certain form and color and was required to match it with another block identical to it. On each task, a score of "1" was given if the child correctly matched identical objects, and "0" if he made an incorrect match.

2. Large/small classification. Two tasks were presented, each requiring the child to separate large and small blocks into two groups. In the first task, six squares of three colors and two sizes were used; a score of "1" was given if the child correctly separated the blocks into two groups of three large squares and three small squares, and a score of "0" if the child deviated in any way from this pattern. In the second task, eight blocks were used, comprised of three sizes, two shapes, and two colors. In this task, the child was given a score of "2" if he classified the blocks into two groups on the basis of relations existing with in the set of blocks (i.e., 4" red and green rings in the "large" pile and 2" red and green rings in the "small" pile; 2" red and green squares in the "large" pile and 1" red and green squares in the "small" pile). A score of "1" was given if the child displayed any other pattern of classification such that all of the blocks in the "large" pile were equal in size or larger than all of the blocks in the "small" pile. A score of "0" was given if no consistent pattern of classification was displayed.

C. Language Assessment

1. Stanford-Binet Picture Vocabulary (form L-M, year II). The child was presented with a series of 18 pictures of common objects and was required to name them. Each child was scored on the number of pictures he named correctly ("correctness" was judged according to Stanford-Binet criteria).

2. Stanford Binet Identifying Parts of the Body (form L-M,

year II). The child was presented with a large paper doll and was asked to point, in turn, to seven different parts of the doll's body (hair, mouth, feet, ear, nose, hands, eyes). Each child was scored on the number of body parts he identified correctly.

3. Stanford-Binet Comprehension I (form L-M, year III-6). Each child was asked two questions: "What must you do when you are thirsty?" and "Why do we have stoves?" On each question, a score of "1" was given if the child satisfied the Stanford-Binet criterion for correctness, and "0" if he did not.

D. Memory Tasks

1. Stanford-Binet Block Building-Bridge (form L-M, year III). On trial 1 of this task, the child was required to build a bridge out of three blocks after watching the tester build a model bridge. Each child was given up to three chances to build the bridge (i.e., the tester rebuilt the model) if he could not do so at first. On trial 2, the child was required to build a bridge from memory, i.e., with the model absent. On both trials of this test, the child scored "1" if he successfully built a bridge, "0" if he did not.

2. Sigel Memory Matching Test. Three cards, each containing drawings of three common objects were employed in this task. In the Demonstration phase, the child was shown a single drawing of an object and was asked to name it. The single drawing was then withdrawn, and the three-drawing array (one of these drawings being identical to that just seen) was presented. The child was then asked to point to

the object he had just seen; if he could not, he was shown the comparison of the single picture with its counterpart in the array. In the two Test phases of the task, the same procedure was followed with the two remaining three-picture arrays. In the Test phases, however, the child was not corrected for an inaccurate response, i.e., the tester did not show the child the comparison of the single drawing with its counterpart in the array. In each of the two Test phases, a score of "1" was given if the child remembered the single drawing and pointed to it in the array, and a score of "0" if he was inaccurate or did not respond.

E. Pantomime

1. Pantomime with four cue conditions (adapted from Sigel et al., 1972). In this test, the child was required to pantomime actions associated with common objects, two objects in each of four separate cue conditions. In the first condition, the child was asked to "show me what you would do" with each of two objects, without any objects or pictures present as cues. In the second condition, pictures of the two objects whose actions were to be pantomimed were present as cues, and in the third condition, the actual objects were in view but out of the child's reach. In the final cue condition, the objects whose actions were to be pantomimed were in view and within the child's reach. If a child appropriately pantomimed for both of the assigned objects in one condition, he was not required to go through the following conditions, since it was assumed that performance in the

more difficult, abstract, cue conditions would assure performance in the easier, concrete, conditions. If, however, a child could appropriately pantomime for neither or for only one of the assigned objects in one cue condition, he was required to continue through the conditions until he successfully pantomimed for both of the objects in a condition. Since pantomiming the actions associated with two objects was required in each of the four conditions, a score of eight successful pantomimes was maximum for this task. Each child was given a score from 0 to 8, based upon the number of actions he successfully pantomimed, and children who "passed" at an earlier condition, and thus were not required to go through the later conditions, were considered as having passed these later conditions and were given the appropriate score (e.g., a child who successfully pantomimed for both objects in condition 1 was given two points for that condition plus six points for presumably passing the later conditions, yielding a score for the task of eight).

Social Competency

The California Preschool Social Competency scale was selected to provide a measure of social development. This scale was designed to evaluate social competence in children aged from 2 years, 6 months through 5 years, 6 months, and its norms were based on teacher ratings of children attending preschool or nursery school programs.

The scale consists of 30 items considered representative of critical behaviors in the preschool child's social functioning, each item containing four descriptive statements representing varying degrees of competence relative to the behaviors measured by the items. The virtue of this rating scale is that the descriptions of the items are in behavioral terms; observations of actual performance are required, thereby minimizing subjectivity in judgment and maximizing the objective reliability of the resulting scores.

The teachers in the I.V.Y. Program received the rating scales in late May, and completed the scale on the basis of the children's capabilities at the end of the school year.

Results

Table V presents the means of the obtained scores for each of the measures by group (experimental and control) and age level of the children. The age level factor was obtained by dividing the sample at the median age of 44 months into "youngest" and "oldest" children.

The variable in Table V listed as "distancing" is a composite variable created from the scores on the measures that were both logically and empirically related to the distancing hypothesis described above. It was obtained by combining the scores on Pantomime, Memory Matching, and the second question of Comprehension I, all of which were highly correlated. This measure is considered an overall estimate of the children's ability to use symbolic systems to go beyond the immediate stimulus situation, i.e., to use symbolic representation. It is thus a major test of the curriculum.

The first outstanding feature of the results is that experi-

Table V

Test Data Mean Scores by Group and Age Level

	EXPERIMENTAL		CONTROL	
MEASURES	Youngest	Oldest	Youngest	Oldest
Form board #1	1.000	1.000	1.000	.963
Form board #2	1.000	1.000	1.000	1.000
Identity match #1	.933	1.000	.808	.889
Identity match #2	.933	.867	.885	.889
Large/small #1	.567	.867	.654	.852
Large/small #2	.767	1.233	.885	1.185
Picture vocabulary	12.600	13.467	10.962	12.815
Body parts	6.800	6.933	6.577	6.852
Comprehension I, #1	.367	.308	.333	.370
Comprehension I, #2	.467	.733	.308	.519
Bridge-building #1	.700	.967	.731	.889
Bridge-building #2	.500	.900	.615	.815
Memory match #1	.867	1.000	.846	.889
Memory match #2	.833	.933	.769	.926
Pantomime	4.533	7.133	4.769	5.926
Distancing	6.700	9.800	6.692	8.259
n =	30	30	26	27

mental children are better than controls on the majority of the measures. The exceptions are the two large/small classification items, comprehension I, #1, and bridge-building #2, where controls exceed experimentals by small margins.

Simple univariate F-tests on each of the variables are presented in Table VI. These values are reported not so much for their value as inferential statistics, but primarily as descriptive statistics. These statistics do give, however, an estimate of the magnitude of the differences with respect to the variability of the data. For each measure three F's are reported. These are the tests of the age effect (A), group effect (G), and the group by age interaction (GA). Basically the F-tests show whether the test results differ according to the age of the subject, the group (experimental or control) that the subject is in, and whether the differences between groups are a function of the age of the subjects.

The tests of primary interest are the tests of G--the differences between experimental and control groups. None of the measures on which the controls exceed the experimental children show any significant difference. Three measures show significant differences in favor of the experimental group. These are Identity match #1, picture vocabulary, and Comprehension I, #2.

Many of the measures show significant age effects as indeed they should. If the older children are not better on items there is good reason to suspect that the items are invalid. The most likely reason

TABLE VI

Univariate F-tests of Significance for All Measures Contained in the Test Battery

MEASURES	F(df = 1, 109)		
	G	A	GA
Form board #1	1.134	.964	1.092
Form board #2	0	0	0
Identity match #1	4.950*	1.939	0.019
Identity match #2	0.050	0.322	0.362
Large/small #1	0.221	9.728**	0.396
Large/small #2	0.065	6.898**	0.314
Picture vocabulary	8.448**	11.783***	1.616
Body parts	2.418	4.322*	0.541
Comprehension I, #1	0.013	0.017	0.278
Comprehension I, #2	4.095*	6.052**	0.093
Bridge-building #1	0.099	9.524**	0.600
Bridge-building #2	0.043	14.107***	1.510
Memory match #1	1.379	2.670	0.661
Memory match #2	0.288	3.947*	0.197
Pantomime	0.751	12.358***	1.733
Distancing	1.487	14.670***	1.514

(*$p < .05$; **$p < .01$; ***$p < .001$)

for a non-significant age effect in the present battery of tests is that all children pass. This is called the "ceiling effect." An examination of the means supports the argument that for most measures with no age effect, average performance is very near the upper limit of the measure.

None of the GA interaction tests in Table VI are significant. A separate analysis of the two age levels, however, indicated that some of the measures may be differentially affected by experimental treatment within age levels. Picture vocabulary effects appear to occur within the younger group only ($p < .005$). Most interesting of all, however, is the fact that most of the measures which were planned to measure the distancing hypothesis show significant differences within the older age group. Identity matching #1, Comprehension I, #2, memory matching #1, pantomime, and the composite distancing variable all show marginally significant effects of treatment within the older age group, the experimental children exceeding the controls.

As was stated above, the tests reported above should be considered primarily descriptive in nature. Where a number of statistical tests are performed on correlated data (correlated because they are derived from the same subjects) it is impossible to interpret the probability values in a straightforward fashion. To actually determine the statistical significance of the outcome, multivariate statistical techniques are required. The overall multivariate test between experimental and control subjects was performed using nine variables. Only nine variables were used in the analysis because these were considered the critical items for estimating the effect of the program. Measures which showed essentially no variance (e.g., the form board items) were dropped. The measures retained for this analysis were: Identity match #1 & #2, Picture vocabulary, Body parts, Comprehension I, #1 & #2, Memory match #1 & #2, and Pantomime.

The multivariate test of age indicated a highly significant effect ($p < .01$) which was expected and nonremarkable. There was no overall group by age interaction ($p < .718$) and none of the individual univariate F-tests suggested significant GA effects. The overall multivariate test of groups, however, was of marginal statistical significance ($p < .054$). Given that variables were included in this analysis which were near the ceiling effect and inflating the error term, it is reasonable to conclude that there are overall significant effects of the experimental treatment. A discriminant function analysis performed in conjunction with the MANOVA indicated that the greatest contribution to the overall test comes from the variables Identity matching #1, Picture vocabulary, and Comprehension I, #2.

The social competency data were analyzed in a multivariate test using the 30 separate variables, rather than simply testing the overall differences in total scores. As with the other test data, social competency was broken down by group and by age at the sample median.

The overall test indicated highly significant effects of age

($p < .044$) and group ($p < .001$) but no GA interaction. The age effect is expected and needs no discussion. The difference between the experimental and control groups, however, is striking and does require elaboration.

The overall group effect is large and consistent and clearly favors the experimental group No single behaviors out of the 30 test items show a significant difference in favor of the control group, but five items show a significant difference favoring the experimental group. The items on which experimental subjects are better are variables 1, 2, 9, 11, and 14. A description of these items is available on the scale shown in Appendix III. The important fact to note is that the variables on which the experimental subjects are better than the controls with one exception are "cognitive" variables. Self-identification and identification of others by name (1 & 2), following new instructions (9), and explaining things to other children (11) are all social behaviors that involve symbolic processes. Only returning property (14) does not make intuitive sense as a cognitive variable.

It must be noted that the social competency data should be interpreted with great caution. It is derived from teacher ratings and, obviously, the teachers are part of the experiment. The question is: did the curriculum actually modify the children's social behavior or did it just modify the way the teachers perceived the children? Either of these effects would appear to be beneficial so that the results do suggest a positive effect for the program being evaluated. The specific localization of the effects, however, remains problematical.

Discussion

Overall, the test results suggest that the experimental curriculum had significant effects which improved the functioning of the experimental subjects in several areas. An interpretation of the results is made somewhat difficult because of the lack of variance on several of the measures. This ceiling effect apparently reduced the overall significance of the results, but, even so, a fairly consistent picture emerges.

Experimental subjects are better than controls on almost all measures, and where they are not, the differences are small and insignificant. Three measures taken separately show significant differences between the groups. These measures are Picture vocabulary, Identity match #2, and Comprehension I, #2.

A more telling analysis results when the entire group is divided on age at the median of the sample. This analysis suggests that the effects on Picture vocabulary occur solely within the younger subjects. The variables that give evidence of distancing ability, on the other hand, show differences only within the older subjects.

The fact that distancing appears to be improved only within the older subjects is in one sense a negative finding for the curriculum project. The primary targets of the study were the youngest children in the I.V.Y. schools--children who were still two years old during the implementation. The findings suggest that the curriculum was, in fact, most effective for children who were three at the time of implementation. This effect could be due to one of two factors.

First, the youngest children might not have the capacity (in the sense of "structure" as defined in the Rationale) to perform the tasks required to demonstrate distancing. One assumption of the current program is that we cannot produce new cognitive structures, but only teach children to more effectively use those that they already have. One of the most interesting questions in future testing with the I.V.Y. sample will be whether these younger subjects show effects of distancing instruction on later tests.

A second possibility is that the age effect seen is a social confound. The curriculum exercises depend heavily on participation by the children. It is possible that since older children are more competent than younger ones, the older children receive more benefits from interacting with the teachers by being asked to answer more questions, etc. This possibility needs to be checked by more detailed observations of children in the program.

A point of interest is the highly significant effect of the experimental curriculum on social competency. The program was designed as a cognitive rather than social program, and the fact that it apparently had effects on social maturity is potentially important. As was noted above, the actual items that were affected are items which are presumably cognitive in nature. That is, the items that involve naming, explaining, etc. This finding underlines one critical point which cannot be overlooked. In children, social development is inherently cognitive and cognitive development is inherently social. The major emphasis of the curriculum is on the aspects of cognitive functioning that result from social interaction. It is hardly surprising if such a program also effects the social skills of the children.

All the statements up to this point have involved comparisons of experimental and control subjects. The evidence that the experimental curriculum is effective consists entirely of the difference between the two groups of subjects. Although highly speculative, there are two lines of evidence that suggest something about the absolute performance of the entire I.V.Y. Program compared with national norms. First, children in the I.V.Y. Program did better than expected on all tests. The tests selected for the evaluation were the tests that Sigel et al. (1973) had found to be most important at the end of the first year of their project. The fact that many of our tests show ceiling effects indicates that the children in the I.V.Y. Program are doing somewhat better than Sigel's subjects at a comparable time in the intervention program. The second line of evidence is that the control group is at roughly the 50th percentile on the California Preschool Social Competency Scale and the experimental subjects at about the 60th percentile. The control group data are most impressive since they suggest that the I.V.Y. Program without the experimental curriculum package is doing a good job in fostering the social development of the children in its care.

These considerations suggest that the level of functioning within the control group is relatively high compared with other children of comparable backgrounds. This in turn would suggest that the effects of the experimental curriculum package would have been even more striking if a truly untreated control group had been available.

Conclusions

The following conclusions are suggested by the findings of the experimental study. They are listed in intuitive order of importance or priority. Obviously, future work with the I.V.Y. Program and with the curriculum may require that some of these points be revised. However, at this point in time, the following appear justified on the basis of sound experimental data.

1. It is possible to transmit to teachers, including many paraprofessionals, a curriculum designed to foster more effective use of cognitive abilities.

2. One effective device for such transmission is the use of highly structured, specific, lesson plans.

3. The degree of implementation of the program was unrelated to teacher education or experience--a finding which has been found by other investigators.

4. The cognitive program transmitted through lesson plans appears to be effective in improving the cognitive skills in the following areas:

   a) In younger children, picture vocabulary skills are improved;

   b) In older children, behaviors reflecting the ability to use symbolic processes (distancing) are improved.

5. As an unanticipated benefit, the cognitive curriculum appears to have facilitory effects on social development.

6. Overall, independent of experimental-control differences, children in the I.V.Y. Program appear to be functioning better than children in another, theoretically comparable, intervention program. In social development they are in line with established norms.

References

Bereiter, C., & Engleman, S. Teaching disadvantaged children in the preschool. New Jersey: Prentice-Hall, Inc., 1966.

Bissell, J. S. Planned variation in Head Start and Follow Through. In J. C. Stanley (Ed.), Compensatory education, ages 2-8: Recent studies of educational intervention. Baltimore: Johns Hopkins Press, 1973 (in press).

Bloom, B. S. Stability and change in human characteristics. New York: Wiley, 1964.

Campbell, D. T., & Frey, P. W. The implications of learning theory for the fade-out of gains from compensatory education. In J. Hellmuth (Ed.), Disadvantaged child, Vol. 3. New York: Brunner/Mazel, 1970.

Haith, M. Day care and intervention programs for infants. Atlanta: Avatar Press, 1972.

Karnes, M. B. A quarter of a century of research with young handicapped and low-income children at the institute for research on exceptional children at the University of Illinois. In J. C. Stanley (Ed.), Compensatory education, ages 2-8: Recent studies of educational intervention. Baltimore: Johns Hopkins Press, 1973 (in press).

Klaus, R. A., & Gray, S. W. The early training project for disadvantaged children: A report after five years. Monographs of the Society for Research in Child Development, 1968, 33(4).

Kohlberg, L. Early education: A cognitive-developmental view. Child Development, 1968, 39, 1013-1062.

Sigel, I. E., Secrist, A., & Forman, G. Early childhood education project annual report: January 1971-December 1971. Progress Report on Office of Economic Opportunity Grant No. CG-8547-B/2.

Sigel, I., Secrist, A., & Forman, G. Psycho-educational intervention beginning at age two: Reflections and outcomes. In J. C. Stanley (Ed.), Compensatory education, ages 2-8: Recent studies of educational intervention. Baltimore: Johns Hopkins Press, 1973 (in press).

Thorndike, E. L. The principles of teaching. In G. M. Jonciek (Ed.), Psychology and the science of education. Richmond: William Byrd Press, 1962, 55-70.

Webb, R. A. Learning, emotion, and language in group experience: Some speculations on why group procedures work. In P. S. Houts & M. Serber (Eds.), After the turn on, what? Champaign: Research Press Company, 1972.

Weikart, D. P. Relationship of curriculum, teaching, and learning in preschool education. In J. C. Stanley (Ed.), Preschool programs for the disadvantaged. Baltimore: Johns Hopkins Press, 1972.

Zimiles, H. Has evaluation failed compensatory education? In J. Hellmuth (Ed.), Disadvantaged child, Vol. 3. New York: Brunner/Mazel, 1970.

APPENDIX I

DESCRIPTION OF CODING CATEGORIES FOR

TEACHER OBSERVATION CHECKLIST

CHECKLIST FOR TEACHER RATINGS

QUESTION: Teacher's verbalization is in the form of a question.

STATEMENT: Teacher's verbalization is in the form of a statement.

MOTOR RESPONSE: Teacher requires a motor response from the child.

ONE-WORD ANSWER: Teacher requires the child to give a brief, one-word answer; this includes a yes/no answer.

NAME/LABEL/CLASSIFY: Teacher gives or requires the child to give the name of an object, its verbal label, or its class name.

DESCRIBE/EXPLAIN: Teacher describes an obect, situation, or action to the child; teacher explains what is going on, why something is happening.

TRANSFORMATION: Teacher describes an event in terms of "if-then." Teacher performs a transformation with appropriate verbalizations. Teacher requests the child to perform a transformation.

MATCHING: Teacher points out the similarities between objects or requires the child to do so, in an effort to match the objects.

IMITATION/PANTOMIME: Teacher acts in a pretend manner and/or encourages the child to imitate her.

ANTICIPATION: Teacher asks child to think about something in the future.

RECOLLECTION: Teacher asks child to think about something in the past.

ELABORATION: Teacher requires the child to "tell more" about a situation or object.

DIRECTIVE: Teacher gives the child a positive directive, requiring the child to start something or to go s mewhere; teacher gives the child a negative directive, requiring the child to stop something.

VALIDATION: Teacher repeats a statement the child has made.

CORRECTION: Teacher corrects a statement a child has made.

OTHER: ANY miscellaneous statements or activities (singing, counting, greetings)

REFERENTS: Teacher refers to either a visible object or person, a non-visible object or person, or a picture.

APPENDIX II

TEST BATTERY PROTOCOL

Test Battery Protocol

A. PERCEPTUALLY ORIENTED TASKS

1. Stanford-Binet three-hole form board

Say, "I am going to put some things on the table so that you can play with them. Don't start to play until I tell you." Present the board with the blocks in place. Place the board with the base of the triangle toward C. Say, "Watch what I do." Remove the blocks, placing each on the table before the appropriate recess on the side toward C. Then say, "Now put them back into their holes." The trial is ended when C has arranged the pieces to his satisfaction as indicated by pushing back the board or looking up at you.

2. Stanford-Binet three-hole form board, rotated

Say, "I am going to put some things on the table so that we can play with them. Don't start to play until I tell you." With the board in position 1 (the base of the triangle toward C), remove the blocks from the board while C watches. Place each block before its proper recess on the table toward C. Then rotate the board, while C watches, to position 2 (with the apex of the triangle toward C) and say, "Put them all back where they belong." Give three trials, repeating the same procedure for each trial.

B. CLASSIFICATION SKILLS

1. Identity Matching

Trial 1: Place the 2" white square in the left side of the divided box, the 2" red square in the right side. Give C another 2" white square and say, "Put this block with the one that is just like it."

Trial 2: Place the 4" green ring in the left side of the divided box, the 2" green ring in the right side. Give C another 2" green ring and say, "Put this block with the one that is just like it."

2. Large/small classification

For each trial, place the blocks in a random pile in front of C and say, "Put the big ones in this side of the box (indicating the left side -- for C -- of the box) and the little ones in this other side (indicating the right side for C)."

Large/small classification (continued)

Trial 1 (6 blocks):

2" red square
1" red square
2" green square
1" green square
2" white square
1" white square

Trial 2 (8 blocks):

4" red & green rings
2" red & green rings
2" red & green squares
1" red & green squares

C. LANGUAGE ASSESSMENT

1. Stanford-Binet Picture Vocabulary, year II

Material: eighteen 2"x4" cards with pictures of common objects.

Show C the cards one at a time. Say, "What's this? What do you call it?" Record any answer C gives.

2. Stanford-Binet Identifying Parts of the Body

Show C the large paper doll and say, "Show me the doll's _______" for the following body parts:

a) hair
b) mouth
c) feet
d) ear
e) nose
f) hands
g) eyes

3. Stanford-Binet Comprehension I

Ask C two questions:

1. "What must you do when you're thirsty?"

2. "Why do we have stoves?"

D. MEMORY TASKS

1. Stanford-Binet Block Building -- Bridge

Trial 1: Place the twelve 1" cubes in a random pile before C and then build a bridge of three blocks beyond C's reach. Say, "See if you can make one like this. Make yours (pointing to a place on the table away from your model) right here." Give C three chances (i.e., jumble the blocks and re-build your model) to build a bridge IF NECESSARY.

Trial 2: Jumble the blocks again, destroying the model bridge and C's bridge. This time, ask C to make a bridge again, but don't provide a model. "See if you can make another one like we did before. Make one right here (pointing)."

2. Sigel Memory Matching Test

Material: three sets of cards containing drawings of common objects.

A. DEMONSTRATION. Place the first picture (scissors) in front of C and say, "What's this? Do you know what this is called?" After 5 seconds, provide the correct name yourself if C has failed to do so -- "This is a scissors." Then remove the picture and approximately 3 seconds later, replace it with the card containing three pictures (one of which is the scissors just seen). Say, "Look at these. Show me the one that you have just seen. Put your finger on it." If C is incorrect or if he doesn't respond, you indicate the correct response by showing C the comparison of the first picture of the scissors with the scissors in the 3-picture array. "Look, here is the scissors you saw first and here is another one just like it." Point back and forth between the pictures, calling attention to the fact that they are the same.

B. TEST. Continue with the two remaining pictures and their corresponding 3-picture arrays using the procedure followed in DEMONSTRATION, but, do not correct C's choice or allow him to compare the first picture with the picture in the array. The order of presentation of the two test pictures is: pencil, apple.

E. PANTOMIME

1. Pantomime with 4 Cue Conditions

Material: pictures of a ball, cup, pencil, and spoon, and the corresponding objects.

I. Without objects or pictures present.

A. DEMONSTRATION. Without having any objects or pictures present, say, "We are going to play a game. I am going to ask you to show me what we do with some things. But, first, let me show you. Let's pretend that I have a ball in my hands. (Cup your hands.) What could we do with this ball? We could throw it. (Make throwing motion with your hand.) We could catch (or roll) it. (Make catching or rolling motion.) We could bounce the ball. (Make bouncing motion.)."

Then say, "Let's pretend some more. This time you show me what you could do with a ball." If the child does not initiate any action, ask for a specific response: "Show me how you would throw a ball." Encourage the child to make the appropriate motions and when necessary repeat the motions for the child.

B. TEST. Now say, "Let's play some more., Show me what you could do with a cup. Pretend that you have a cup right here. Show me what you would do with it." Encourage C, but don't make any motions yourself. Give C about 30 seconds to respond, then continue the same procedure with the pencil. In all of the TEST conditions, if C gives a verbal response alone, encourage a gestural response. For example, if he says "coffee" or "drink" when you're asking about the cup, say, "Show me," or "Show me with your hands" how to use the cup. Do not use any action words such as "drink" or "write" unless C uses them first.

IF C HAS PERFORMED ADEQUATELY ON THE TWO TEST ITEMS IN PART I, STOP. YOU NEED NOT GO ON TO PART II.

IF C DID NOT PERFORM ON BOTH TEST ITEMS OF PART I, GO ON TO PART II.

II. With pictures one at a time in C's view.

A. DEMONSTRATION. Follow the same DEMO procedure as in Part I, as it appears appropriate. This time, though, refer and point to the picture of the ball as you ask C what he would do with it.

B. TEST. Use the same test procedure as in Part I, this time using the spoon and cup as test items. Refer to and point to the appropriate pictures as you ask C what he could do with each item.

IF C HAS PERFORMED ADEQUATELY ON THE TWO TEST ITEMS IN PART II, STOP. YOU NEED NOT GO ON TO PART III.

IF C DID NOT PERFORM ON BOTH TEST ITEMS OF PART II, GO ON TO PART III.

III. With objects in view but out of reach.

A. DEMONSTRATION. Follow the same DEMO procedure with the ball, but this time hold the ball in your hand out of C's reach. Say, "Here is a ball. Don't touch it now, but pretend that you have it in your hand. What could you do with the ball?" If C doesn't initiate any action, ask for a specific response (e.g., "Show me how would bounce the ball."), as before.

B. TEST. Follow the same TEST procedure as before, but hold each object in view but out of C's reach as you ask him what he could do with each. Use the pencil and spoon as test items. Note: If C persists in reaching for an object, say, "Don't touch it now -- just pretend that you have it in your hand ..."

IF C HAS PERFORMED ADEQUATELY ON THE TWO TEST ITEMS IN PART III, STOP.

IF C DID NOT PERFORM ON BOTH TEST ITEMS IN PART III, GO ON TO PART IV.

Pantomime with 4 Cue Conditions (continued)

IV. With objects in reach.

A. DEMONSTRATION. Follow the same DEMO procedure, as appropriate. This time, though, place the ball on the table close to C as you ask him to show you what he could do with it.

B. TEST. Follow the same TEST procedure with the cup and pencil as test items. Place each object on the table within C's reach as you ask him to show you what he could do with each.

Note: In Part IV, an appropriate response can be either actually using the object (e.g., throwing the ball) or just pantomiming without touching the object (e.g., pretending to drink out of a cup without touching the cup). Just make sure that you note exactly what C does in this case.