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ABSTRACT

After discussing the differences in the physical, social, and attitudinal environments of advantaged and disadvantaged children, this paper describes the educational settings and intervention practices that were designed as part of the Carolina Abecedarian Project to assist young disadvantaged children in attaining educational competence. An overview of the project's organization, conceptual framework and daily action plan is provided. Specific activities designed to help prepare children in the program for the social and behavioral demands of the public schools are described. The role of parents in the program is also described. Special emphasis is placed on the development of communication skills in preschool children. Strategies developed by the program to promote a particular kind and amount of verbal interaction between teacher and day care pupil are listed. Objectives of this language intervention approach and methods employed for achieving these objectives are outlined. Two examples of results from this program show that the program is accomplishing its goal of preventing retarded intellectual development and improving linguistic performance. Social policy implications for preschool intervention programs are considered. (Author/SB)

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The Abecedarian Approach to Social Competence: Cognitive and Linguistic Intervention for Disadvantaged Preschoolers

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"... it is not easy for an education,
with which love has mingled, to
be entirely thrown away."

Rousseau

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The Abecedarian Approach to Social Competence: Cognitive and Linguistic Intervention for Disadvantaged Preschoolers

It is axiomatic in education that environments affect development. It is also generally accepted that children from poor and under-educated parents have more difficulty in school than children from affluent and well-educated parents (see, for a recent empirical example, Ramey, Stedman, Borders-Patterson, & Mengel, 1978). The causes of this school difficulty, and in the extreme, school failure--are undoubtedly multiple and interactive. Educators have been assigned the large task of carrying out social reform: of diminishing the likelihood of school difficulty or school failure for the disadvantaged, and thereby increasing their likelihood of socioeconomic success. That facilitating educational success can guarantee later socioeconomic success is an assumption society has rightly begun to question: education may be a necessary rather than sufficient condition for social or economic achievement. Given this large task, educators have been allotted relatively meager resources for accomplishing it. They are forced, then, to use the most powerful tools that limited knowledge and resources have to offer.

Education always occurs in particular cultural contexts with presumptions being made about the backgrounds of the learners. Therefore, to be maximally effective in exerting educational leverage to the benefit of disadvantaged children, it is important that we know the disadvantaged child's typical ecologies. Knowledge of the typical ecological forces will allow more precise and carefully targeted use of the limited resources available to the educator. As a beginning step i..

the generation of that knowledge, this chapter will summarize the information which has been obtained from a longitudinal early intervention program that has collected extensive preschool ecological and child development data for the past seven years. The chapter will begin with a description of the child's physical, social, and attitudinal ecologies and proceed to an extensive description of the educational settings and practices that were designed as part of the Carolina Abecedarian Project to assist young disadvantaged children attain educational competence. We will present a sampling of results from this work on experimentally altering the educational ecology of children of poverty and conclude with the implications that we draw from these results concerning social policy for preschool programs.

Ecology of the Disadvantaged Preschooler

The disadvantaged child lives in a very different world from his upper middle-class peer. His world looks different, smells different, tastes different, feels different and sounds different. To be sure, there are similarities. Both can know joy, love, fear, and want; but, at almost every turn the paths for the advantaged and the disadvantaged diverge. The more desirable of these two paths is almost always trod by the advantaged--and, both the advantaged and disadvantaged know this truth. It is these differences in ecologies that we assume to be of paramount importance for determining life satisfaction and contribution to society. We begin this chapter by describing some of the things that we have learned in the past seven years of the Abecedarian Project about the physical, social, and attitudinal ecologies of advantaged and disadvantaged children. It is these predisposing ecologies that are the context for our educational efforts.

Physical Environment

Information about the physical setting of the home for advantaged and disadvantaged infants has been presented by Ramey, Mills, Campbell, and O'Brien (1975). Using Caldwell, Heider and Kaplan's (1970) Home Observation for Measurement of the Environment (HOME) we found that lower socioeconomic status homes were characterized by relatively disorganized environments and lacked age-appropriate toys and opportunity for variety in daily stimulation when infants were 6 months of age. The homes also tended to be poorly lighted, to have a high density of people, and to vary considerably from one another on many physical and other dimensions. Table 1 is an attempt to provide a quick synopsis of some salient characteristics of these homes.

Insert Table 1 About Here

Several points are to be noted from Table 1. First, 45% of the families live in households containing 5 or more members. Thus, the households tend to be somewhat larger than is typical for today's nuclear family. Further, about 15-18% of the houses are rated as dilapidated and unfit for occupancy. The children tend to sleep in rooms containing not only other children but also one or more adults which in all probability indicates a serious crowding situation. Finally, these somewhat crowded households typically contain one or more members who smoke. The extent to which these conditions contribute to the child's development is at present unknown; however, it is abundantly clear that these physical arrangements are vastly different from those enjoyed by socioeconomically more advantaged children. Further, as the second

column of figures in Table 1 indicate, there is remarkable stability in these characteristics over a three year period.

Attitudinal Environment

Attitudes represent a set of assumptions which bear some as yet only partially understood relationship to specific parenting practices. Nevertheless, the attitudes of advantaged and disadvantaged parents differ in ways that are parallel to the differences in their children's development. Whether these attitudinal differences are causes or correlates of child change is at present unknown. However, they are part of the psychological environment of the child and probably are not trivial. We know that by the time their infants are 6 months of age lower SES mothers score as more authoritarian and less democratic in their child-rearing attitudes but also as less hostile toward and rejecting of the homemaking role than their more advantaged peers. They also perceive themselves, probably realistically, as more controlled by external forces than as internally controlled (Ramey & Campbell, 1976). Such attitudes lead us to presume that there is less creative flexibility in child rearing and more pessimistic fatalism in the environment of the disadvantaged child compared to the advantaged one. Further, this somewhat glum maternal perception of life exists essentially from the child's birth and is relatively unchanged during, at least, the first two years of its life (Ramey, Farran & Campbell, 1979).

Social Interactional Environment

Beginning as early as 6 months and continuing throughout the preschool years, the disadvantaged child is interacted with by adults somewhat differently than is the advantaged child. The differences appear to

be smaller in early infancy and to become larger as the child grows older. For example, Ramey, Mills, Campbell, and O'Brien (1975) have reported that the mothers of disadvantaged infants tend to be less responsive verbally and emotionally, more punitive and less involved with their infants when observed within their own homes. These results have been replicated and extended in a recent report by Ramey, Farran, and Campbell (in press) who used both naturalistic mother-child observations in the child's home and constrained observations in a laboratory setting. We found that disadvantaged mothers talked less to their 6 month old infants than advantaged mothers even though those two groups of infants did not differ in their rate of nonfussy vocalizations. At 20 months, advantaged mothers continue to talk more to their children and to interact with them more frequently in a laboratory setting. Farran and Ramey (1979) have recently reported a factor analysis from these interactional observations in which a first factor labeled as "Dyadic Involvement" was isolated at both 6 and 20 months. Disadvantaged and advantaged dyads did not differ significantly on this dimension at 6 months but were different at 20 months with the advantaged dyads scoring as more involved. Further, the factor scores on this dimension significantly predicted the child's IQ at 48 months.

Thus, some of the evidence available from the Abecedarian Project seems to suggest that infants and their mothers share different social, attitudinal, and physical ecologies from the child's early infancy depending on what social niche they occupy. The at-home and laboratory observations suggest that the early language environments of advantaged and disadvantaged children may be a major difference between the two groups. Further, these language environments are linked to the child's

subsequent general intelligence and, presumably, to his subsequent school achievement. Therefore, to the extent that this relationship is causal and not just correlative, it becomes a particularly salient target for educational intervention.

After a brief description of the overall organization of the educational intervention component of the Abecedarian Project we will present a conceptual framework and plan for daily action that guides our language-oriented intervention program during the later part of the preschool years.

Description of the Abecedarian Intervention Program

Admission of Families

The Carolina Abecedarian Project began in 1972 to intervene with infants and children believed to be at high risk for school failure. Families were referred to the project through local hospitals, clinics, the Orange County Department of Social Services, and other referral sources. Once families had been identified as potentially eligible, a staff member visited them at home to explain the program and to determine whether they appeared to meet selection criteria. If so, mothers were invited to the Frank Porter Graham Center for an interview and psychological assessment.

During their visit to the Center, which typically occurred in the last trimester of pregnancy, demographic information about the family was obtained and mothers were assessed with the Wechsler Adult Intelligence Scale (WAIS; Wechsler, 1955). Final determination of eligibility was made following this visit. Criteria for selection included maternal IQ, family income, parent education, intactness of family, and seven other factors that were weighted and combined to yield a single score called the High Risk Index (see Ramey & Smith, 1977, for details). Only families at or above a predetermined cutoff score were considered eligible.

We admitted four cohorts or groups of families between 1972 and 1977. The oldest children are now over seven years of age and are attending

the local public schools; the youngest children are now approximately two years of age. Of 122 families judged to be eligible for participation, 121 families initially agreed to participate knowing that they would be assigned randomly to an educationally treated group or to a control group. When these 121 families were randomly assigned to the Day Care group or to the Control group, 116 or 95.9% accepted their group assignment. Of these 116, three children have died and 1 child has been diagnosed as retarded due to organic etiology. Not counting these four children we have, then, a base sample of 112 children. Of these 112 initially normal children, 8 have dropped from our sample as of September 1, 1978. Thus, not counting attrition by death or severe biological abnormality, 92.9% of our sample is intact after 6 years. This represents a sample attrition rate of 1.18% per year. Some characteristics of families admitted to the Abecedarian Day Care and Control groups are summarized in Table 2.

Insert Table 2 about here

General Characteristics of The Early Childhood Education Program

The early childhood program serves up to 50 children who participate in the Abecedarian project. Most of the children enter the program at 6 weeks and stay in the program until they enter public school kindergarten. When there are openings for additional children, they are recruited from the community to provide a racial and socioeconomic mix. The educational program occupies all of one floor and a portion of another floor of a four story research building. The educational program is open five days a week for fifty weeks of the year from 7:30 to 5:15 p.m.

Staff

Twelve teachers and assistants are responsible for providing the educational program for children. Following are the teacher/child ratios and group size for each age group:

1978-79 School Year

Age	Teacher/Child Ratio	Number of Staff	Group Size
6 wks.-12 mos.	1:4	3	12
12 mos.-24 mos.	1:4	2	7
24 mos.-36 mos.	1:4	2	7
36 mos.-48 mos.	1:6	2	12
48 mos.-60 mos.	1:6	2	12

In addition to the teaching staff there are three administrative staff- the program director, a secretary and a transportation supervisor.

Teaching staff vary in their level of formal training. Some teachers have A.B. or M.A. degrees but some staff who are in head teacher positions have demonstrated skill and competencies in working with young children in lieu of formal education and degrees. The average number of years experience of staff who work with young children is seven years. Staff development is an on-going process. The language training program which has been one of our major staff training activities will be described later in this chapter. In addition to the individuals who staff the classrooms, a consultant in behavior management and social development is available to teachers on an on-going basis Consultants conduct staff workshops and meet with staff on an individual basis to discuss problems of individual children and general classroom organization and management strategies. Other consultants are brought in to conduct workshops when the need arises.

Opportunities are provided for staff to attend local, state, and national workshops pertaining to the education of young children. In addition, staff are encouraged to pursue child-related courses through technical institutes and the state university system.

Medical Care

The medical care component at the Frank Porter Graham Child Development Center provides complete medical care for the Abecedarian Project children who attend the Center. The health care team is also actively involved in research on respiratory tract infections and their complications - a common problem with preschool-aged children. The health care team is composed of three pediatricians, a family nurse practitioner and a licensed practical nurse.

Well Child Care

Assessments are made at ages two, four, six, nine, twelve, eighteen, and twenty-four months, and yearly thereafter. The parents are present at the assessments for an exchange of information and counseling. A health history and a social history are obtained and a complete physical examination is performed. Parents are taught and counseled in the areas of feeding and nutrition, weaning, cleanliness, skin care, child growth and development, behavior, toilet training, accident prevention, and dental hygiene. Parents are encouraged to express their concerns and to discuss problems that they are facing.

Appropriate immunizations (diphtheria, pertussis, tetanus, polio, measles, mumps, and rubella) as recommended by the American Academy of Pediatrics are given. A sickle cell preparation is obtained at age nine and twelve months from all black children. A skin test for tuberculosis is given yearly.

A hematocrit is done at age nine and eighteen months and yearly thereafter. Routine screening for vision and hearing is provided annually.

Ill Child Care

There is daily surveillance of all children in the Center for illness. The children are allowed to continue to attend the Center when ill except in the case of chickenpox. The children are seen when ill by one of the health care staff. A history is obtained and a physical examination done. Appropriate laboratory tests and cultures are performed. Parents are informed of the nature of the child's ailment, and the prescribed treatment is discussed with the parents by note or phone. The child is followed through the illness until recovery.

The Educational Characteristics of the Program

Because a description of the infant toddler program can be found in previous papers (e.g. Ramey, Collier, Sparling, Loda, Campbell, Ingram, & Finkelstein, 1976; Ramey, Holmberg, Sparling, & Collier, 1977; Ramey & Campbell, 1979; Ramey & Haskins, in press) the primary focus of this section is a description of the program for three and four year olds. The development of the program for threes and fours has been a cumulative process. When appropriate, outside consultants have provided assistance and input. However, the most vital people in the development of the program are the teachers who have taken ideas from a number of sources and integrated and applied them in their respective classroom situations on an hourly basis.

The program has stabilized over time, but there will always be changes as the staff continually strive to develop a program to meet the needs of individual children. In describing the educational program, four major areas will be discussed--the physical environment, the daily schedule, the curriculum, and the parent component.

Physical Environment

One of the distinctive features of the program is the organization of the physical environment. Large areas of space are divided into classroom areas of approximately 1000 square feet by creating low walls with a series of 5 feet x 2 feet modular blocks. The physical space in each classroom is organized using the following principles discussed in greater detail by Harms and Cross (1977). Nuturant day care environments are:

Predictable and promote self-help.

Supportive and facilitate social-emotional adjustment.

Reflective of the child's age, ability and interest.

Varied in activities.

In accordance with these principles, classrooms are organized to promote self-help and independence. Child-sized furniture is used and materials are stored on low open shelves to promote easy accessibility. Pictures of the material or symbols are used to designate the space the material occupies on the shelf or wherever the material is to be stored. For example, big trucks in the four-year-old class are stored in a "garage" designated by masking tape. When children clean up or are finished with the trucks, they match the size of the truck with the marked off space. Blocks are stored on shelves in the space designated by the size and shape of the block. Through the use of pictorial labeling, children are able to function independently in that they are able to select materials and put them away without the assistance of the teachers.

Materials are organized in well defined interest areas; thus, children are able to function systematically in their environment. It is clear to children where in the classroom each activity is to take place. The fol-

lowing centers are within the classrooms of three and four year olds: blocks and construction materials, science, listening, book corner, manipulative games, housekeeping/dramatic play, and art. The value of having a space where a child can be alone is recognized and provided for in each classroom. In day care where children are frequently part of a group, children need to be able to have privacy once in a while. In each classroom, a private space is available for the child who wants to get away from the group and be alone. In addition, each classroom has a warm, cozy area with a rug and pillows which children can enjoy.

Children's work is displayed throughout the room and predominates over teacher-made bulletin boards. Conventional display space is at a minimum; therefore, one can see art work, picture stories as well as three-dimensional work (art dough, clay) on cabinets, walls, doors, and windows. We strive to have children feel that they are contributing to the appearance of the classroom and that their work is valued.

One of the greatest challenges we have faced in day care is to provide variety in the daily program and at the same time ensure program continuity. This is particularly true in the Abecedarian program because the children attend the day care program for the first five years of their lives. There is a danger that everyone will develop dulling routines. Therefore, variety is consciously provided in a number of ways. There is both indoor and outdoor space for the development of motor skills. The outdoor area is used frequently for activities that are traditionally indoor activities such as art, dramatic play, sand and water, and science.

Through field trips, the setting for learning is broadened. Particularly during nice weather, children explore and learn through trips to various community settings. There is a sequence of activities that teachers typically follow which includes planning and preparing children for the trip and a systematic follow-up on returning to the center. Unusual places are explored such as a turkey farm, the dog pound, the reservoir, or a grist mill in addition to more common places like the fire station and the library. In the summer, trips to swimming pools and to playgrounds are planned just for fun.

Variety is also provided by rotating, changing and adding materials to various learning centers. For example, the science center changes often depending upon the educational objectives to be accomplished. One week the center might include a water table with floating and sinking objects. The next week there might be a color mixing activity. The nature of the block center also changes. For example, farm animals might be added after a trip to the farm. The housekeeping area is easily converted into a grocery store by adding a cash register, boxes, cans and a check-out area. Frequently, a non-permanent center such as cooking or woodworking may be added for a few days each week. It takes a great deal of creative teacher planning and preparation to continually motivate young children day after day by providing variety in day care.

Daily Schedule

The Daily Schedule of three's and four's can be found in Table 3.

Insert Table 3 about here

As can be noted, there are a number of similarities between the two age groups. In planning daily activities, there is a mixture of teacher-planned structured

activities, creative experiences, and opportunities for child-selected activities. Activities are planned for large groups, small groups, and one-to-one interactions. Small group activities focus on developing specific skills in language, reasoning, mathematical concepts, and writing. In addition, small group activities are valuable in developing attending behavior, task orientation, listening skills, and working towards task completion.

The objectives for the small groups are based on individual needs of children and a checklist is used to assess individual children's needs. Thus, activities of small groups are adapted to meet individual needs within each group.

During circle time, concepts, units and themes are developed. For example, a unit on transportation may be discussed over a number of days. This unit might be coordinated with field trips to the airport, the bus station, or a garage. Action songs, finger plays, flannel board stories, story telling, and listening to rhymes take place. Young three year olds spend a very short time in a large group, about five to ten minutes at a time. As the time nears for children to enter public school, the length of time spent in a large group increases and the circle becomes more academically oriented.

Children's Planning

A short circle time each day is devoted to children's planning before center time. At this time a child has to make a decision about which center he will go to and what he will do there. The purpose of this aspect of the program is to encourage each child to plan and make decisions about his immediate future. This avoids the aimless wandering that sometimes happens when children are given unplanned free choice. Teachers encourage children to follow through on their plans and to report their accomplishments.

Center Times

For center time, teachers make special plans for two or three centers. One day there may be a special art activity in the art center as well as a special science activity in the science center. The remainder of the centers will be available to the child a but will not be highly dependent on adult supervision. The role of teachers during this time in the special centers is to interact with children and to insure that children are following through on their plans and carrying out the activities of the special centers for the day. In the last few months before children go to public schools, the nature of the times in the centers changes.

The Cognitive Curriculum

Curriculum is defined as the activities and interactions that children are involved in during the day. Most of these activities and interactions are planned. However, the informal interactions and unplanned experiences that are generated during the day are also an integral part of the curriculum. With respect to the formal curriculum, there is not just one set of packaged activities for teachers to draw from. Rather, teachers are able to choose from the best of what is available keeping in mind the specific needs of individual children. Some of the curriculum resources which are used are the GOAL math program (Karnes, 1973), Peabody Early Experiences Kit (Dunn, Chun, Crowell, Dunn, Avery & Yachel, 1976), and Bridges to Reading (Greenberg & Epstein, 1973).

Social and Adaptive Behavior

The daily program is to create an ecology in which adaptive and social behaviors can be manifested and reinforced. The program aim is designed to elicit social and adaptive behaviors through creating an environment in which these skills can be fostered and by using a specific social curriculum which makes children aware of appropriate behaviors and feelings.

The area of social and adaptive behavior has been influenced more than any other area by opinions of public school teachers. There are three major priorities which are addressed by activities in this area:

1. Improving and strengthening task-oriented behavior
2. Improving peer relations and interactions
3. Improving teacher (adult)-child relationships

My Friends and Me (Davis, 1977) was selected as a packaged social curriculum for the purpose of making children aware of their own feelings and emotions, and of appropriate responses to these feelings. In addition, lessons are chosen from this program to help children understand cooperation, sharing, and being kind and helpful to others. Teachers realize that they must help children generalize from the specific activities to situations in the classrooms as they occur.

During the late spring and summer before children go to public school kindergarten, the environment is consciously engineered to prepare the children for the social and behavioral demands of the public schools. In order to increase the children's ability to function independently with high task-orientation, the following activities and procedures are carried out.

The daily schedule is posted on the wall. The schedule is discussed daily. Children are frequently asked, "What are you going to do next?" "What are we doing now?"

Center activities are reorganized. Specific tasks are set up in all centers. Children are expected to complete tasks and then move to another center. Each task has a definite beginning and end. The adult role is to plan the activities, explain the activities to the children, supervise the centers, take data, and interact with the children at the completion of the task in center. Children are asked frequently to work independently in

centers without immediate adult supervision. An example of a sequence is as follows:

Housekeeping

In this center the children are to do the following:

1. Set the table with knife, fork, spoon, plate for four people.
2. Put pretend coffee on the stove.
3. Pretend to cook vegetables in a pot on the stove.
4. Pretend to serve the vegetables on the plates and serve the coffee in cups.
5. They are to sit down and call the teacher.
6. While they are pretend-eating, the teacher will engage them in conversation for about 5 minutes.
7. They are to take the dishes off the table and put them in the sink.
8. They are to pretend to wash the dishes and put them away.
9. When they are finished with this, they are to put their names on the table to indicate to the teacher that they have completed all of the activities in that center.

Instead of praising children's work, the teachers try to get the children to start reinforcing themselves and to be relatively independent of adult feedback. Instead of the teacher's saying, "That's a pretty picture," the child is asked "Why do you like your picture?" The teachers focus on giving feedback on the effort rather than the product. Teachers begin to use descriptors rather than praise. The reason behind this is to give the children feedback without qualifying the product as good or bad. For example -- "You are building a red block road. I see that you used the small red blocks for the curves."

Parent Program

The focus of the parent program is to improve communication between parents and the teachers. We hope that by letting parents know what is taking place in the program, parents will, in turn, become more supportive and reinforcing of the program's goals for their child. Various strategies are employed to enhance communication. Group meetings are held to explain the goals of each classroom and the curriculum. Individual conferences are held between parents and teachers to discuss individual children. At least once a month children take home a special newsletter. The prime focus of the newsletter is a "Do Together Page" (see Table 4 for a sample page). The purpose of the "Do Together Page" is to involve the parent in reinforcing an activity being done at the Center. Each "Do Together Page"

Insert Table 4 about here

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is constructed so as to encourage verbal communication between the parent and child.

Parents are invited and encouraged to come to class and to share their skills and talents with the children in special activities such as weaving, making cookies, or knitting.

A parent advisory group meets periodically to plan social activities and share parent concerns about the program.

As part of the end point evaluation of the preschool program, parents of the day-care-attending children are asked to complete a Parent Satisfaction Questionnaire. This scale is composed of questions that have forced-choice alternatives that vary on a scale from 3 to 1 in terms of their desirability. For the 21 children who have graduated into the public schools

we have tabulated results from 6 of the more general questions asked. Table 5 contains the means and standard deviations associated with each of those seven questions.

These figures seem to indicate that the parents are quite enthusiastic about the preschool program. This impression is buttressed by the spontaneous comments made by the mothers during the end of preschool interviews.

The Abecedarian Approach to the Development of Communication Skills

What Linguistic Research Has to Say

Since it is the middle SES child who does well in expressive language, we turned to the literature on differential communicative environments provided in middle versus lower class homes to find clues for organizing our day care environment. The following general teacher strategies that we use have been extrapolated from the research on adult-child verbal interaction.

1. Talk to children often; even short, simple utterances help if they are frequent. Mothers and caregivers who talk frequently to children, even in language characterized by relatively more imperative, directive statements, still manage to produce children with average receptive competence. Tizard, Cooperman, Joseph, and Tizard (1972) conducted observational studies in long-stay British residential nurseries that suggested even low-quality talk (short, simple utterances tied to the immediate situational context) can foster linguistic ability ranking at the mean on standardized tests (Minnesota Preschool Scale and Reynell Scales of Receptive/Expressive Language) if it occurs often enough (from 38-65% of observation blocks). Loban (1963), Tulkin (1972) and Streissguth and Bee (1972) also found that preschool children who are talked to frequently, regardless of the quality of the talk, tend to do better in academic situations later on. However, in the Tizard et al. (1972) report, the institutionalized nursery children who were average in comprehension (receptive language) did less well in expressive language, and did not appear to initiate talk with adults nearly so often as do children with typical middle class home environments. The authors speculate that this may be owing to active discouragement of close caregiver-child relation-

ships in the 13 British nurseries and to the attendants' perfunctory responses (e.g., "That's nice") when children did initiate. "Very significant correlations" were found between frequency of informative talk and frequency of answering the children, and children's comprehension scores. The implication is therefore strongly made in the Tizard et al. findings that amount of talk alone can be helpful, but specific qualitative levels of caregiver language are required for good receptive development. Thus, the second general strategy:

2. Model high quality talk for optimal development -- talk that is informative: reflective, problem-solving, creative, and abstract. (see also Hess & Shipman, 1966; Bernstein, 1961; Levenstein, 1969).

3. Respond to child-initiated conversation by active, reflective listening and by extending what the child has said in further comments. (Cazden, 1972). Cazden (1967) studied three categories of contingent responses to toddler vocalizations: repetitions (repeating what the child has said word for word); expansions (repeating and correcting grammatically); and extensions (picking up on the content of the child's talk and extending it by another question, comment, or exclamation logically related to it). Of the three, only extensions positively influenced development after children were 24 months old. To promote more and better expressive language, then, caregivers need to "keep the conversational ball in the air" (Rieke, 1975; Rieke, Lynch, & Soltman, 1977) by follow-up verbalizations that extend what the child has begun.

4. Ask questions, and use pauses and repetitions of a child's previous comments, when appropriate, to promote active child responding and conversational mutuality (multiple speaking turns for both partners in communication). Stein (1973) investigated mothers' versus fathers' speech and found that mothers' dialogues with their children were

characteri-ed by more speaker changes (turns). In mother-child talk, both parties in the interchange hold the floor: implying mutuality.

5. Keep directive, behavior-managing talk low to a minimum. A low incidence of imperatives in maternal speech appears positively related to language acquisition (Streissguth & Bee, 1972). Imperatives are concomitants of language that aims at managing behavior ("Sit down," "Keep quiet"), rather than initiating an interchange or stimulating thought. Nelson (1973) found that only 35% of middle class mothers' language to children under three was comprised of directive commands and requests; other researchers have also shown that mothers become even less directive and more informative, as well as linguistically complex, in their speech to older children (Snow, 1972; Phillips, 1973). Ward (1971) postulated that imperatives and directive forms of language in general are characteristic of environments in which children's linguistic mastery is devalued; Bernstein (1961) earlier produced evidence for this in his sociolinguistic research. Hess and Shipman (1966) found that the specificity of mothers' information was positively related to language acquisition, whereas the incidence of using imperatives was negatively related.

6. Increase the probability that steps 1-5 will occur by arranging for frequent 1:1 tutorial-type sessions; there, adult attention can be focused on a child and sustained dialogues involving several speaking turns can go on (Blank, 1973; Tough, 1976; Cazden, 1972; Bruner, 1971). Most of what the literature has shown to be facilitative of language growth is hardly surprising: we would expect that, in order to learn to communicate well, children need to hear a great deal of language; need opportunities to practice with a responsive audience; and need models who follow up child conversational leads, providing high quality demonstrations of

"what more could be said." They also need speech input to be modified for their developmental levels (Snow, 1972; Phillips, 1973). All these facilitative elements presuppose frequent instances of continuous intimate interaction with a child. The evidence is that the more intimate the interaction, the better. One of the best-established empirical findings concerning sibling status is that eldest children achieve more intellectually and linguistically than later-borns in the same family. Having the mother to herself or himself, the firstborn enjoys a degree of tutorial-intensity that promotes better learning.

7. Read to a child daily in 1:1 or (very) small group sessions, cuddling the child, sharing his/her visual focus, and speaking in close auditory range. So carried out, reading provides a positive experience of physical contact and shared pleasure; further, written language offers unique language stimulation, since the essence of written language is distance from the here and now. "It is important to remember," says Cazden, "that the child's linguistic environment is not limited to everyday speech interactions. Reading to children, in particular (and their later reading to themselves), can be a "particularly potent form of language stimulation":

> ...reading aloud is likely to stimulate meaningful conversation about the pictures to which both the adult and the child are attending.
>
> ...Because language in books differs from speech in both structure and distance from nonverbal context, it may have qualitative as well as quantitative significance...(In a preschool book about a worm) one passage read ("The worm's mouth is at the fat end, The worm's tail is at the thin end.") Had the teachers been talking instead of reading, the children probably would have heard some-

thing like this: "His mouth is here (as she points), and his tail is here" (as she points again). Children's books also include idiomatic expressions. (Again, a book about a worm:) ("He measured and measured, inch by inch, until he inched out of sight.") (1972, p. 294)

In short, writing is "not just speech written down" (Kolers, 1970). The important point is that readers and listeners probably benefit from the difference. Stories also provide a child with opportunities to project into a character's experience, to share his viewpoint and feelings.

8. Create activities for the classroom that stimulate discussion, and make discussion part of every suitable experience: particularly after the fact, when commentary and reflection will demand recall of a no-longer present stimulus (Gahagan & Gahagan, 1972; Sigel, in press). Particularly useful is to support and extend children's imaginative play with comments, to enrich it through language (Tough, 1973, Levenstein, 1969).

9. Structure situations that make certain language uses obligatory.

It can be very useful for teachers to stretch the child's abilities to alter communication referentially to suit a listener's needs (non-egocentric communication) by providing distance from a listener -- as in telephone or walkie-talkie or blind screen games and tasks (Maratsos, 1973; Shantz, 1975) and imaginative role-playing exercises (Smilansky, 1968; Shaftel & Shaftel, 1967).

It is also useful to vary, on occasion, the intense, warm, responsive relationship that the child has with a "maternal" (not necessarily female) communicator by providing the exertion of a less intimate partner in conversation.

Mothers' speech contains more exclamations and questions, as well as "other indices of the close mother-child relationship" (Stein, 1973).

This is contrasted with the fathers' tendency to involve the child less, to elicit child commentary less often, and to pay less attention to what the child says. Berko-Gleason (1975) also found evidence of this paternal tendency in the relatively less sensitive modifications in speech to children that fathers made: while fathers, like mothers and apparently all adults, shorten utterances and slow down their speech to children, fathers' mean length of utterance was less closely tied to the child's than was the mother's; and, where mothers used shorter, syntactically simpler utterances with the younger of two children, fathers tended to address longer utterances to daughters regardless of their age. Berko-Gleason notes that this difference is partly owing to fathers' tendency toward speech filled with imperatives, particularly in talk with sons: "Since imperatives have a zero preverb length, this contributes to the shorter average length of father-son utterances." (p. 291). Berko-Gleason offers one qualifier to the usual generalization about the type of adult language partner needed by the language-learning child. A warm, child-sensitive mother figure to interact with is important for development of expressive facility, but a distant, less sensitive father-like figure has a role as well:

> The children had to exert themselves for their fathers, and try harder to make themselves both heard and understood...The opportunity to try out new linguistic skills on someone not as intimate as your mother but closer than a stranger may be one of the hitherto unrecognized benefits of coming from an intact family. Perhaps the first step to the outside world, and the one in which linguistic skills get sharpened, is the one where you try to tell your father what happened while he was away. (Pp. 293-4).

With the knowledge from linguistic research which we have just synthesized, we began to construct a language program to facilitate the communicative competence of our high-rish three and four year old children.

Progress Toward Developing the Abecedarian Approach To Preschool Language/Communication

We have attempted to define an approach that gets beyond forms to the development of an elaborated code. In doing so, we have agreed with a position similar to that of the Duchess in Alice in Wonderland: "Take care of the sense and the sounds will take care of themselves."

The focus of our effort to date has been to promote a particular kind and amount of verbal interaction between teacher and day care pupil. The kind of verbal interaction is largely modeled on what a middle class mother establishes with her child; the amount is rather higher, perhaps like what a tutorial hour might afford. Because our day care effort is competing with many hours of experience in another type of linguistic environment in the home, we have assumed that it cannot be as casual and diluted as normal family interaction. To raise certain types of linguistic functioning in the child's response hierarchy, then, we are trying to provide a large number of practice opportunities.

The Language Intervention Approach

The language intervention approach that has been adopted rests on several assumptions:

1) The acquisition of communicative competence is the primary goal.

2) The notion of communicative competence is multi-faceted, implying competencies in at least three interrelated dimensions:

   a) social (pragmatic) competence (language use)

   b) representational competence (level of abstraction)

   c) linguistic competence (language structure -- syntax/semantics)

3) The child acquires effective communication skills mainly through exercising these skills with adults who are effective communicators and particularly in situations in which the child is able and motivated to engage (i.e., intentionally) in the interaction with the adult.

Thus, the language development approach is focused at the level of "Critical skills" (i.e., successful communication in situations where the child really wants to communicate), with the awareness that there are specific prerequisites for success. Teachers learn to apply the approach in any potential interaction with children. In this way they can capitalize on those situations and activities that happen to motivate individual children. In addition, teachers can use the approach in planning cohesive sequences of class activities and projects according to particular needs and constraints.

Teachers are given inservice training and consultative help in assessing children's needs, setting objectives, planning and implementing activities that will stimulate particular kinds of communication, and in evaluating their own interactions with the children. For example, an early aim in staff training was that teachers would use informative (vs. directive) language with children in 75% of their verbal interactions. To help teachers acquire understanding of this basic distinction, a didactic session handout (see Table 5) at the beginning of the year presented definitive and illustrative examples.

Insert Table 5 about here

At the end of the didactic session, a worksheet quiz (Table 6) assessed

Insert Table 6 about here

staff understanding of the concepts presented. As teachers reached a criterion of 80% on didactic quizzes, observations began in the classroom to assess their application of the information - sharing/eliciting strategy. Each week, teachers were asked to surpass their previous week's performance by 25%, until they had reached a criterion of 75% informative language in interactions with children.

When teachers had reached the 75% informative, non-directive objective, the focus became a particular linguistic function within the larger "informative language" category -- specifically, one of seven social functions of language identified by Joan Tough (1976): See Table 7 for a presentation of Tough's framework.

Insert Table 7 about here

Once teachers had mastered the framework so that they could reliably classify adult and child language according to its categories, consultants helped them to select objectives to work on in the classroom each week, and guided them in devising activities that would help children reach the objectives set.

Objectives Developed with the Day Care Staff in Communication Skill Development

Following our review of linguistic research, we began to develop an approach in which teachers agreed to:

1. Learn to classify language according to two major categories: information sharing/eliciting, and directive.
2. Learn to classify language according to seven categories within information sharing/eliciting: self-maintaining; directing; reporting; logical reasoning; predicting; projecting; imagining. (Tough, 1976)
3. Demonstrate at least 75% informative language in verbalizations to children.
4. Demonstrate ability to model and elicit language in each of Tough's 7 categories of informative language: (see 2 above).
5. Set short-term objectives for children to reach in specific categories of language use (given long-term objectives set by language consultants to the classrooms).
6. Devise activities to stimulate language in specific categories of communicative use (given advice and assistance in developing materials by language consultants).
7. Learn to assess "quality of response (for age level)" in children's language -- in specified categories of language use (reporting for the three year old class; reporting, logical reasoning, predicting, and projecting for the four year olds), given a consultant-developed rating scale to guide assessments.
8. Provide each child daily with at least 3-5 minutes of private conversation.
9. Read and discuss a story, poem, picture sequence, or other written material with each child daily in 1:1 or very small group sessions.
10. Elicit a number of active verbal responses from each child daily. (Number variable from child to child).

At present, consultants meet weekly with teachers for two hours to assist them in mastering the approaches developed and to help with plans and activities for the following week. Working from the language uses classification system developed by Tough, the consultants wrote criterion-referenced objectives for each strategy within four of the seven categories of language use: reporting, (pre) logical reasoning, predicting, and projecting. The criteria were based on estimates of what the three and four year old groups would be able to achieve; the estimates were guided by results of half-hour language samples done early in the fall on each child, using a series of wordless picture stories as stimuli for questions requiring reporting, (pre) logical reasoning, predicting, and projecting responses. A sample criterion-referenced objective for year-end achievement in (pre) logical reasoning for the four year old group is the following:

1. Child can explain a 5-step process, including and correctly sequencing all 5 steps; and using explicit, clear references

   -in a present experience, with picture cards to aid recall
   -in an immediately preceding experience, without picture cards to aid recall
   -in a recent experience, with verbal reminder of a key incident or detail
   -in a remote experience or potential situation

In weekly planning sessions with the language consultant, teachers select one or more long term objectives as a focus for the next week's activities in the classrooms. Activities that will stimulate the particular language use selected for focus are proposed and planned for.

A sample weekly Plan Sheet (Table 8) will illustrate the translation of objectives into activities for the classroom;

Insert Table 8 about here

Consultants conduct observations in the classrooms following the planning meeting to monitor teachers' interactions, children's responses, and the progress of activities. The data resulting are prepared and discussed with the teachers in the next week's meeting, as a guide to setting new objectives and preparing new activities.

Intellectual and Linguistic Results of the Abecedarian Preschool Intervention

In order to evaluate the relative impact of the Abecedarian Program with its particular curricula emphasis, a variety of standardized and experimental measures are administered at periodic intervals. Typically, the performance of the day-care-attending children is compared as a group, with that of the randomly assigned control group mentioned earlier. Under the logic of the randomly constituted day care and control groups, differences between the two can reasonably be ascribed to the variables that have been manipulated -- namely the day care program and its associated curriculum. As a conclusion to this chapter we will review two examples of results from the Abecedarian program which we believe indicate that the program is accomplishing its goal of preventing retarded development in intellectual and linguistic performance.

Intellectual Results

Ramey and Campbell (1979) have presented results from intelligence tests for the day care and control groups administered at 12, 24, 36, and 48 months. The scores at 12 months were obtained from the Mental Develop-

ment Index of the Bayley Scales of Infant Development. At the other three ages the scores are from Stanford-Binet assessments. Figure 1 contains a graphic portrayal of the mean scores by groups. Statistical analyses

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Insert Figure 1 about here

---

indicated no differences between the two groups at 12 months. At each measurement occasion thereafter, the two groups differed significantly. The difference between the two groups is due to a decline from normality in the control group which reached a mean IQ of 81 at 48 months. Further, for each child in the day care group who scored below 80 at 48 months, 6 children scored below 80 in the control group. Thus, the day care program appears to be preventing developmental retardation in this high-risk sample of disadvantaged children. As a beginning effort to analyze what particular intellectual abilities were affected by our intervention program, we performed item analyses of the Binet protocols. Item analyses of these protocols revealed that 17 items at 48 months significantly discriminated between the two groups. Of the 17 items, 10 were language items. Thus, language seems to be an important aspect of the general intellectual decline.

Linguistic Results

To pursue this language deficit possibility more closely, the McCarthy Scales of Children's Abilities, which yield a separate verbal subscale, were administered at 30 and 42 months of age to the day care and the control groups (Ramey & Campbell, 1979). There was a significant difference in the Verbal Scale Index between the two groups at 30 months. This difference persisted at 42 months with the day care group scoring at the national average and the control group below average. These findings lead to the conclusion that:

"Early educational experience did result in accelerated language development [as measured by the McCarthy Verbal Subscales] which was apparent before age 3. By age 42 months, the difference in language development still existed...Earlier development of language competence in center-attending children relative to their non-center-attending controls is supported by these results."

Social Policy Implications for Preschool Intervention Programs

The educational program of the Carolina Abecedarian Project has altered the educational ecology of disadvantaged children from birth, and has apparently succeeded in preventing a significant amount of developmental retardation during the preschool years. There are a few, but only a few, other demonstrations of successful preventive programs in the research literature. By far, the most famous of those programs is the pioneering work of Skeels (1966) with institutionalized infants who were subsequently adopted after being transferred to a ward where they were cared for by retarded adolescent girls. In comparison to a group of infants who did not have the additional attention bestowed by these additional caregivers and who were not adopted, the adopted children were markedly superior in achieving normal adult status. Recent work by Scarr and Weinberg (1976) on the transracial adoption of black infants from disadvantaged homes who were adopted by advantaged white families also supports the positive power of major ecological change on intellectual development. Finally, this preventive thesis is also supported by a recent research report from France by Schiff, Duyme, Dumaret, Stewart, Tomkiewicz, and Feingold (1978). They reported that working-class children who were adopted in upper-middle-class home were superior intellectually to their subsequent biological siblings who were reared by their natural mothers.

The Skeels (1966), Scarr and Weinberg (1976), and Schiff et al. (1978) studies all relied on a drastic ecological intervention (adoption) to prevent intellectual retardation. This form of intervention surely raised fundamental issues in social ethics and social policy concerning disadvantaged families. Thus, while they make excellent theoretical contributions to

our understanding of the malleability of intelligence, they offer relatively little help in solving the problems of a large segment of the disadvantaged population in this country.

It is at the pragmatic level of working with disadvantaged families that we believe the Abecedarian Project can make a meaningful contribution for disadvantaged families who are at high risk for producing a developmentally retarded child. If one accepts, as demonstrated, that significant amounts of developmental retardation can be prevented through a relatively limited ecological intervention, then the major practical questions become: (1) how can we improve the effectiveness of such programs; (2) how can equally effective but less costly programs be developed; and (3) how do we optimally match various facets of successful programs with the needs of individual families? We think that research and development into these questions deserves a high priority on the public agenda for the 1980s.

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Footnotes

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1. Abecedarian (ā′ bi si dâr′ i ən): a pupil who is learning the letters of the alphabet; 2. a beginner; 3. primary: rudimentary.

Table 1

Information on the Physical Ecology of High-Risk Children in the First and Third Years of Life

Characteristic	1st Year N=56	3rd Year N=40
Number in Household		
≤ 5	55%	48%
5-7	45%	37%
≥8	13%	5%
% houses with 1 or more other preschool children	98%	100%
% houses with 1 or more elementary school children	52%	47%
% houses with 1 or more junior or senior high school students	44%	27%
Type of Housing		
Single Family	53%	35%
Multiple Family	47%	65%
Dilapidated	18%	15%
Sleeping in Room with Child		
1 or more preschool children	7%	26%
1 or more older children	41%	33%
1 or more adults	73%	77%
Families with 1 or more members who smoke	80%	82%

Table 2

Demographic Data by Experimental and Control Groups

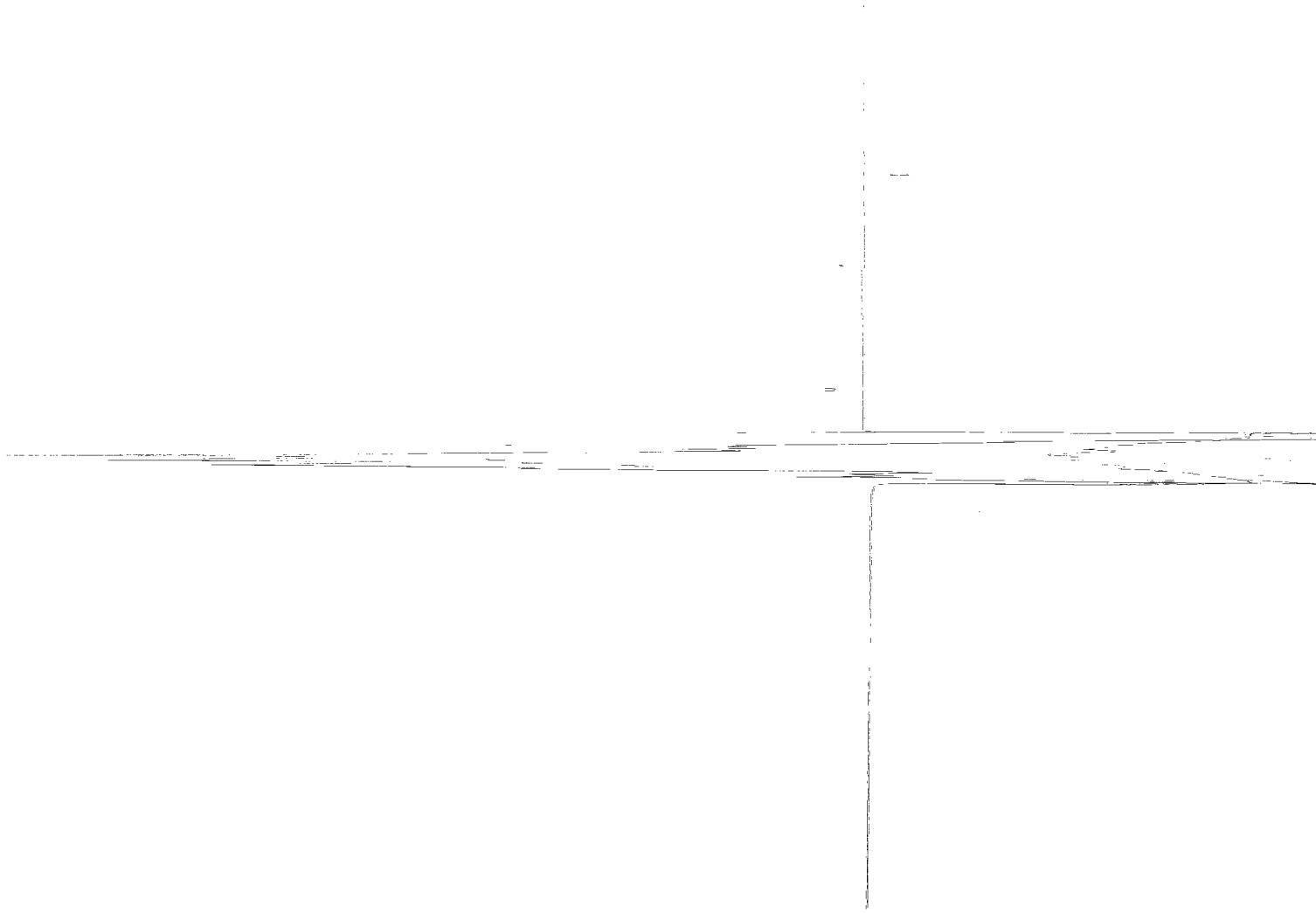
Cohorts I-IV

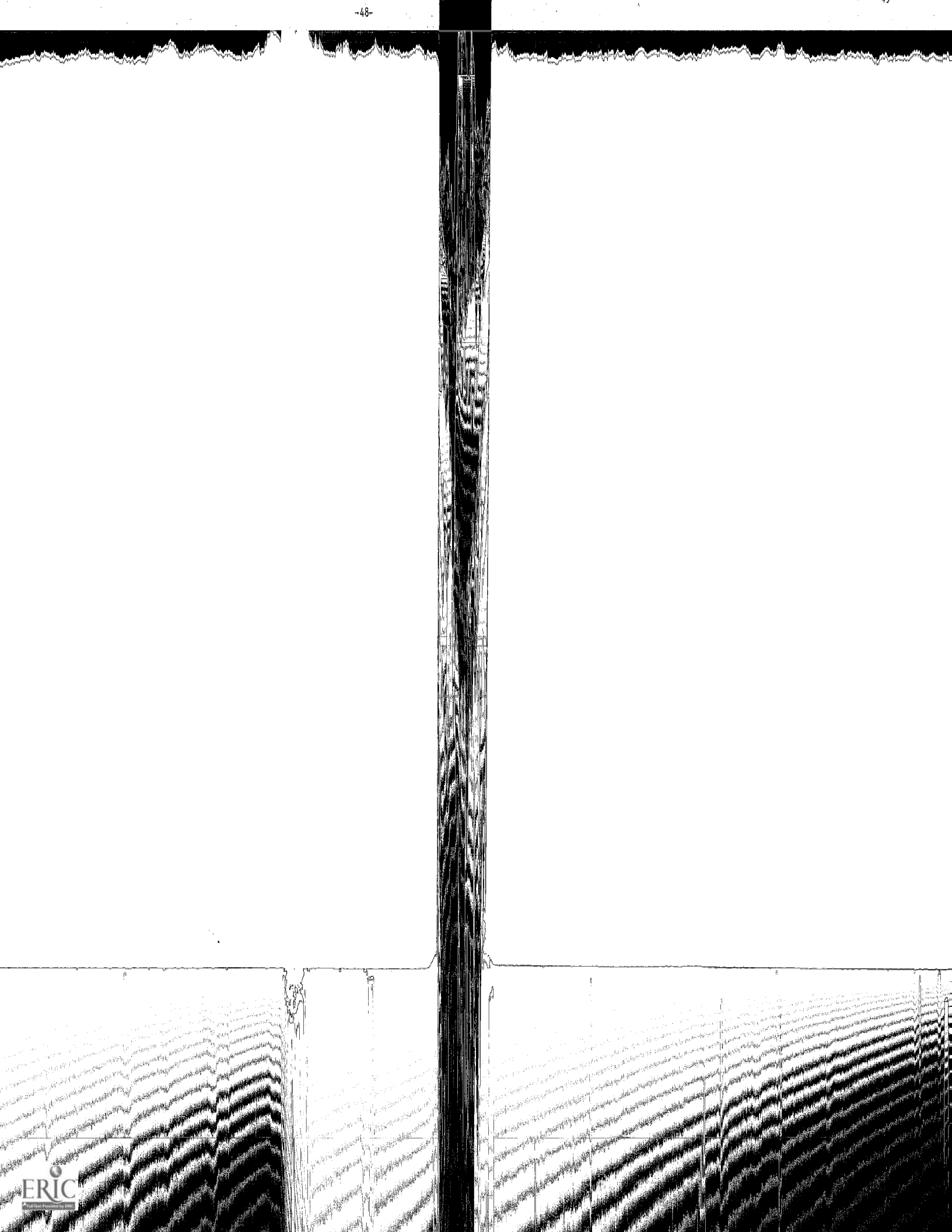
Group	N	Female-headed Family	Mean Financial Income in Year of Birth	Mother's Education at Child's Birth	Mean Maternal IQ at Birth
Experimental	64	82.81%	$1,230	10.27	84.92
Control	57	77.19%	$1,080	10.00	84.19

Table 1

Daily Schedule

8:00	Arrival
9:45	
	Language
11:30	
12:00	
12:30	
12:45	
1:00	
2:30	
3:00	
3:30	
3:30 - 5:15	





Trip to CCF Farmer's Exchange to buy seeds for classroom garden this week

Week of 3-26-79

Table 8

Plan Sheet: Language/Communication

WHO	WHAT CHILD/TEACHER WILL DO	WITH WHAT MATERIALS	WITH WHAT DIRECTIONS	HOW OFTEN
All 4's	Reporting 1, 2, 5 on trip to CCF to buy garden seeds	Seed packets, plants, etc., at CCF store and verbal cues from teacher.	What do we call these seeds/plants? What color are these?	Monday - before and after trip
All 4's	Reporting 1, 2, 3, 4 when planting seed	seeds, dirt, etc., & planting guide cards - for first 3 days; then without cards on Day 4	(Repeat previous questions) Let's see who can remember what we need to do when we plant our seeds	Daily for 4 day
All 4's	Directing 2, 3	In planting experience with cards and teacher prompts on Day 1, only cards on Day 2; without cards - directing another child by Day 3	1) Look at the cards and tell me what you have to do; I'll help you 2) The guide cards will tell you what to do 3) Today we will be teachers, we will help each other remember how to plant seeds	Daily-with variations-for 4 day

Table 8 Continued

Plan Sheet: Language/Communication

WHO	WHAT CHILD/TEACHER WILL DO	WITH WHAT MATERIALS	WITH WHAT DIRECTIONS	HOW OFTEN
All 4's	Prelogical Reasoning 5 and Predicting 1, 2, 4, 5	Garden plants	Let's try to predict what will happen to our plants: -which will come up first -which will come up biggest? -which will be smallest?	On Friday when survey chart is done
All 4's	Projecting 1, 2, 3	With My Friends & Me curriculum lesson: non-destructive ways of dealing with unpleasant feelings	See curriculum	Tues. (Part I) Thurs. (Part II)
All 4's	Reporting 3; Predicting 1, 6; Prelogical Reasoning 5	With My Friends & Me curriculum lesson: Non destructive ways of dealing with unpleasant feelings	What did ___ do? How do you think s/he felt -why? What might s/he do next or what do you think s/he did?	Tues. (Part I) Thurs. (Part II)

*Note: Objectives are keyed to Tough's categories or language use and the numerals (e.g., Reporting 1, 2, etc.) to strategies under each category.

Table 9

Uses of Language: Tough's 7 Categories of Language Function

Self-Maintaining	Directing	Reporting	Ptelogical Reasoning	Predicting	Projecting	Imagining
Tell about own needs, wants; criticize, threaten others to protect own interests, seek attention for self: "I want ice cream", "That's my truck!" "Teacher look at me!"	Give instructions, feedback to self and others on "how to do"	Tell about event, incident in story, real experience, objects: color, size, shape, what happened, compare/contrast; tell sequence of events.	Explaining why a thing happened, what caused it; what made you think so, "how come?"	Say what is likely to happen next, in future, or in some possible situation; what a character will say or do -- in overt words or actions.	Say what a person feels, wishes for, would like also, how a person probably has felt or would feel in a future situation or some other situation than the present.	Making up a story/ possible imaginary situation (I am the Mamma, you are the Daddy; let's pretend we live at the North pole and we can have all the toys; we're fishes and we can't talk, only swim and wave our fins).
Strategies:	**Strategies:**	**Strategies:**	**Strategies:**	**Strategies:**	**Strategies:**	**Strategies:**
1. Referring to physical and psychological needs and wants 2. Protecting the self and self interests 3. Justifying behavior or claims 4. Criticizing others 5. Threatening others	1. Monitoring own actions 2. Directing the actions of the self 3. Directing the actions of others 4. Collaborating in action with others	1. Labelling the components of the scene 2. Referring to detail (e.g., size, color, and other attributes) 3. Referring to incidents 4. Referring to the sequence of events 5. Making comparisons 6. Recognizing related aspects 7. Making an analysis using several of the features above 8. Extracting or recognizing the central meaning 9. Reflecting on the meaning of experiences, including own feelings	1. Explaining a process 2. Recognizing causal and dependent relationships 3. Recognizing problems and their solutions 4. Justifying judgments and actions 5. Reflecting on events and drawing conclusions 6. Recognizing principles	1. Anticipating and forecasting events 2. Anticipating the detail of events 3. Anticipating a sequence of events 4. Anticipating problems and possible solutions 5. Anticipating and recognizing alternative courses of actions 6. Predicting the consequences of actions or events	1. Projecting into the experiences of others 2. Projecting into the feelings of others 3. Projecting into the reactions of others 4. Projecting into situations never experienced	1. Developing an imaginary situation based on real life 2. Developing an imaginary situation based on fantasy 3. Developing an original story