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ABSTRACT

The rationale of some current intervention projects that are designed to supply some environmental nurture (affective and cognitive) is discussed. Some major approaches used in these projects and problems related to early intervention are examined. Head Start and Montessori programs are omitted. Strategies utilized in the programs discussed involve making use of health personnel; emphasize the importance of parent participation; develop competence in parents and thereby enhance their self-image, which in turn causes them to become more sensitive and responsive to the children's needs. Strategies that focus on preparing children for effective participation in the elementary grades are those concerned with neurological organization (large motor training, visuo-motor and perceptual training, oral language training, and packaged programs). Approaches to learning concern the roles of motivation, operant conditioning, immediate reinforcement, and tutoring. The proper time to begin intervention is stated as being before the birth of the baby. Problems related to the design and the evaluation of intervention programs are discussed. To develop effective educational strategies, a number of theoretical and practical problems should be carefully explored. A series of operational intervention centers should be established, and these would feed information into a central agency designed to evaluate strategies and formulate policies for a national program. (DB)

PRESCHOOL INTERVENTION¹

Katrina de Hirsch

Introduction

Growth requires stimulation. Environmental stimulation is indispensable for the realization of the organism's inherent potential. This is amply demonstrated in the literature. Schilder (1964) found that training plays a significant role even in those functions in which maturation of the central nervous system is of primary importance. Bennet *et al.* (1964) observed that enriched experience affects brainweight and biochemical activity. White's (1967) investigations testify to the plasticity of early visuo-motor development. They demonstrate, for instance, that the growth of visual attentiveness is significantly affected by environmental stimulation. Infants subjected to certain modifications in rearing developed top-level reaching behavior in 60% of the time required by the control group. Irwin (1960) demonstrated that young working-class children who were read to and shown picture books 15 minutes a day presented significantly higher phoneme frequency at 18 months than did controls. Schaefer (1965) reported that infants who, starting at 14 months, were tutored 5 times a week for one hour and whose verbal development was encouraged through friendly and spontaneous communication with a teaching adult showed increasingly superior performance as compared with others who had not been tutored.*

There is still much to learn about the relationship between developmental and environmental variables, but it is now accepted that developmental processes unfold as a result of the interaction between the neural substratum and environment at the time of the most rapid growth of a function.

This paper discusses the rationale of some current intervention projects and designed to supply some of the environmental nurture (affective and cognitive) which is believed to lay the foundation for more formal learning.

Conventional Nursery Schools and Kindergartens

Preschool education is, of course, not a novel institution. However, the conventional nursery school and kindergartens serve largely

¹Originally prepared by the author for the Interdisciplinary Committee on Reading Problems, Center for Applied Linguistics.

*For the effects of deprivation of particular input on the development of normal perceptual abilities see studies by Riesen (1961), Held's thesis (1963). The effects of early enrichment have been analyzed by D'Amato and Jahoda (1962), Hebb (1949).

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middle-class children and have traditionally been concerned less with cognitive development than with emotional and social growth. Middle-class children are by and large exposed to rich and varied stimulation in their homes. There is a premium on completing tasks* and on acquiring new skills. Maternal controls are not usually authoritarian--the mother will tend to explain to the child the outcome of his actions, thus engraining the relationship between cause and effect in terms of behavior and the learning of new skills. Hess' (1968) work dealing with the association between social class and the mother's "teaching style" is a beautiful exposition of these phenomena.

While a number of middle-class children, for one reason or another, show marked deficiencies in information processing and oral language development, most 4 to 5 year olds have acquired serviceable verbal tools. The needs of these children are primarily social and emotional. Preschool children have a number of tasks to accomplish; they have to solve developmentally early conflicts along the continuum of Anna Freud's (1965) "Developmental Lines." In order to be "free" for learning they have to be able to separate from home, cope with their dependency needs, give up earlier instinctual gratifications, and they must have gone some way towards resolution of the oedipal situation. They must learn to share, to fight and to live with their peers. The conventional nursery school--whether the goal is explicit or not--must, beyond the teaching of skills such as handling the pencil, help them to cope with these tasks. Stories, "pretend" activities, doll play, etc., all assist children in the mastery of early goals and conflicts. Interaction with their peers prepares them for life in the group during the next phase in school.

"Disadvantaged" children share many problems with middle-class children. Admittedly, children from economically deprived backgrounds are not a homogenous group and a too global concept of deprivation tends to confound the issue.** Nevertheless, the majority have specific

*Social class is, however, not the only determinant in terms of task orientation. In an interesting study, Hertzog et al. (1968) have shown that even at age three, there are demonstrable differences between American middle-class children and Puerto Rican children of comparable intelligence and similar economic backgrounds. The latter simply are not task oriented; they are given few opportunities to acquire mastery. The emphasis in Puerto Rican households is on social interaction, rather than on performance.

**Horn (1970) states that individuals may be disadvantaged socially, economically, psychologically and linguistically depending on the particular social milieu in which they attempt to function . . . as long as they are unable to realize their potential fully or to enter the mainstream of life in their community.

and pressing needs which differ from those of middle-class children. It is not so much that disadvantaged children lack sensory-motor stimulation--most of them are flooded with an array of stimuli which they are totally unable to sort out. Their often chaotic environment does not help these children to sequence and structure events and experiences; as a result they are bewildered and confused.* Moreover, few efforts are made to orient the children towards long-range goals and towards mastery of specific tasks. There are no rewards for tasks completed or new skills acquired. The pervasive "instinctualization" of the milieu, to use Meers' (1969) words, and lower-class child rearing practices as they are discussed by Marans-Lourie (1967) do not help to curb impulsivity or to delay gratification or to sustain effort. Still further, the mother's style of communication does not foster linguistic and conceptual development (Bernstein, 1960). The children are action--rather than verbally--oriented and most of them have trouble processing auditory information or expressing more complex feelings and thoughts. Finally, children from such environments are frequently either apathetic or hyperactive. Little is done in the home to help those with organic deficiencies--and such children exist also in the middle class--to reach their inherent potential and to compensate for their deficits. (Wortis, 1963). According to Pasamanick and Knobloch (1958), "... life experiences and the socio-cultural milieu influence biological and physiological function." Not surprisingly, this "accumulation of deficits" ** (Deutsch, 1965) results in delayed reading readiness and in massive failure in the early elementary grades.

The insistent demand for preschool intervention programs which prepare deprived children to cope with the requirements of first grade is a response to their pressing problems. This demand is reinforced by the fierce competition in middle-class urban and suburban schools, competition that has resulted in academic difficulties for a sizeable percentage of even the more privileged segment of the population. The pressure for scholastic performance has led to considerable criticism

*Pollack (1969) suggests that the middle-class mode of viewing the world in terms of temporal succession is not universal in the American culture and that the lower-class Negro child may receive no reinforcement in his home for sequencing his life.

**Baratz (1970) assumes a radically different position. He maintains that historical and practical factors have resulted in a denial of Negro culture. The assumption underlying intervention is based on deficit models--no matter whether these deficits are viewed as genetically determined or the result of social pathology. He postulates that we deal not with defects but with differences (and attempted to prove it by a linguistic analysis of Negro children's speech). Consequently, a new model must be devised based on cultural differences rather than on deficits "which simply are not there."

of conventional nursery school procedures and has resulted in ever-increasing emphasis on programs designed to "guarantee" academic success. Intervention programs specifically designed to provide supplementary training prior to first grade entrance have thus been established in many parts of the country.

The programs discussed in this paper vary widely in their assumptions regarding the causes of learning disabilities, among which reading failure is the most striking.* Some programs focus on social pathology, others are slanted towards emotional and social determinants of learning; few, if any, are concerned with the subtle interactions between organically determined deficiencies and the lack of biological, cultural and affective nurture found in many environments. Some projects favor training for mothers; most concentrate on the child himself. This paper discusses some major approaches**and, in the discussion, examines some of the problems related to early intervention. Head Start and Montessori programs will not be taken up here since they have been extensively discussed elsewhere.

Strategies Involving Health Personnel

Some intervention programs make use of health personnel. Birch (1968) had this to say:

Recent interest in the effects of social-cultural factors on educational achievement could lead us to

*Reading failure frequently represents one aspect of a generalized learning disability which may be related to a variety of determinants; genetic factors, intellectual limitations, severe environmental deprivation--both affective and cultural--brain injury or more subtle organic deficits, emotional infantilism, frank psychiatric disturbance. There are, however, intelligent and highly motivated children who fail in reading, although they present no structural damage to the central nervous system, who have excellent ego strength and perform adequately in areas not related to printed and written language. Because reading plays so central a role in the elementary grades, few interventional programs make a distinction between generalized learning and specific reading disabilities. Strategies designed to increase motivation, inhibit impulsivity, delay gratification are geared towards prevention of learning disorders in general, while others which stress visuo-motor and oral language training are slanted towards the prevention of reading failure. In the discussion of existing programs, the author has not found it helpful to stress the distinction between the two because they are so often interrelated.

**Specific programs are mentioned only for purposes of illustration and statistical aspects of studies are not discussed.

neglect certain bio-social factors which through direct influence on the developing child affect his primary characteristics as a learner. . . Conditions of ill health may directly affect the development of the nervous system and eventuate either in patterns of clinically definable malfunctioning in this system or in subclinical conditions. In either case, the potentialities of the child as a learner cannot but be impaired.

Interaction between social conditions and health problems are the rule, not the exception. Fifty percent of children from low income groups have health problems unknown to their parents. A survey in Chicago demonstrated that 5% of children from deprived homes have pica and are likely to carry a lead burden that could become toxic under conditions of stress (Haggerty, 1969). Many more children from poverty areas are admitted to hospitals for "failure to thrive" (Hutcheson *et al.* 1970), for being underweight or apathetic, or for suffering from iron deficiency anemia which makes them susceptible to infection. In deprived children the consequences of low birth-weight are far more severe in terms of later learning deficits than they are in middle-class children. (To begin with the incidence of prematurity is nearly 17% as against 5% in the middle class.)

Birch (1969) points to another important fact: Although a child may not present a serious health problem on a medical examination at the age of three, a number of signs reflecting immaturity or maldevelopment may indicate that the same child may have been "at risk" at a much earlier age. A case in point is malnutrition. In a field study carried out by Craviato *et al.* (1965) in Guatemala and Mexico, psychological performance--capacity to learn and to process environmental information--was most depressed in children exposed to malnutrition during the first six months of life. Malnutrition, Birch (1970) points out, is not a crisis phenomenon, it is a condition of life.

Programs designed to identify health problems in preschool children and thus to reduce academic failures have been initiated in some communities. For purposes of intervention, however, health problems must be identified very early in the child's life. Hypothyroidism, for instance--reversible only if detected quite early--may stunt intellectual growth. One to three percent of preschool children need glasses. Even slight deficits in auditory sensitivity at the age of maximal linguistic growth, that is to say, between 16 and 36 months, will drastically interfere with children's comprehension and use of language. Amplification at very early ages--medication or surgical intervention in the case of conductive hearing losses--may determine whether a child does or does not function in the early academic grades. Undetected high frequency losses--and they are not easy to identify--may cause the preschool child to be wrongly

labeled as withdrawn and are bound to interfere with subsequent reading comprehension. This is not the place to discuss ways in which such badly needed services should be delivered. The point to be emphasized is that for effective intervention we need the earliest possible identification of problems. We need examinations directed to often subtle aspects of the child's functioning which affect his potential as a learner; and we need close coordination between health and educational personnel.

Strategies Involving Parents

Weikert and Lambie (1968) say that preschool programs for disadvantaged children which do not involve mothers are bound to fail. "The problem is not to provide enrichment and opportunities for the children but to restructure mother-child interaction patterns." The removal of the children from their homes to more favorable environments even for long periods of the day does not seem to be the answer.

In an investigation of 284 inner city first-grade children, Goldberg (personal communication, 1970) used Wolf's (1968) Scale for rating educational environment to get some estimate of the relationship between measures of specific parental practices and reading achievement. The association was closer than was the case for that of the usual crude index of socioeconomic status.

In her investigation of the relative contribution of seven maternal variables to the academic performance of urban disadvantaged children, Slaughter (1970) was especially interested in three cognitively stimulating behaviors: concepts used by the mother, individualization of the child's personality, and cognitive controls. Seven maternal attitudes and behaviors accounted for 16% of the variance in the children's intelligence test scores. Among the maternal variables, the cognitively stimulating behaviors mentioned above were more highly correlated with children's achievement than were the remaining ones. Slaughter emphasizes the role of the mother as a teacher. Mothering and teaching, she says, go together; the child needs both if he is to perform up to his maximum capacity in an academic setting.

It is clear from these studies that parental practices and attitudes are extremely important in terms of academic functioning. As a result we see a trend away from child-centered intervention toward work with parents. To acquire linguistic and cognitive skills, to learn to curb impulsivity and to delay gratification--all essential ingredients of learning--children need a model. The model is the person the child is emotionally tied to, that is to say, his mother or some other person who shares his day-by-day life. Thus, enduring positive change in the child's development can be effected by improvement in the quality of life at home and through changes in the people intimately associated with him.

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Karnes' (1968) project, for instance, consisted in teaching mothers of four-year olds how to stimulate their children in a variety of ways. In only 12 weeks of two-hour weekly sessions, the children in the experimental group did considerably better than did controls. In one of the most comprehensive preschool projects, Klaus and Gray (1968) emphasized intensive interaction with parents. This resulted in modification of the mothers' attitudes which spilled over into their handling of the older siblings, producing what is called "vertical diffusion." Levenstein (1969) reported on a Verbal Interaction Project which had as its goal the stimulation of communication between mothers and children by encouraging verbally oriented play with toys and books. In this excellent project, social workers "modelled" for mothers the kind of exchange that fosters auditory processing and age-adequate use and comprehension of language.

Wyatt's recent book (1969), "Language Learning and Communication Disorders in Children," vividly describes successful and unsuccessful modes of verbal and affect interaction between mothers and children and might well serve as a guide for interventional programs which enlist the help and participation of mothers.

Modifying their teaching style (Hess and Shipman, 1967) and imparting verbal skills to their children is, however, no easy task for "poverty mothers" who often have been inadequate learners themselves. Swift, in his 1970 paper, described a "mother's storytelling" program designed to teach mothers more effective tools for communication. The participants not only improved their ability to interact verbally with their children, but they began to view themselves as partners in the shaping of their children's development. This, in turn, resulted in modifications of their feelings about themselves.

Strategies Involving Both Parents and Children

The underlying philosophy of earlier work in intervention was based on the assumption that taking children out of an impoverished environment and placing them in an enriched and stimulating one would foster emotional and cognitive growth. It was felt that the longer the time children spent in such environments, the greater the returns.

Results unfortunately were somewhat disappointing. Once children left the program they tended to regress (up to a point this was true also for programs which worked only with parents). Lally (1970) states that it is essential to make changes in the home to help parents cope with the modifications wrought in the child as a result of his experience in an enriched environment. Tannenbaum found drops (1970) in developmental scores in children who have little stimulation in the home once they leave the centers. Schaefer (1969) found that gains made in a child-centered home-visitation project began to disappear once home visitations ceased.

One example of earlier attempts to combine help to both children and parents is the Perry Preschool Project - Ypsilanti, Michigan (1967), which involved two weekly home visits to each family. Tutoring of the child was combined with direct teacher-mother interaction during the tutoring session. The rich and perceptive curriculum was designed to improve perceptual discrimination, conceptual functioning and communicative skills. The program placed the mother in the key role of her child's intellectual development. She became a major participant in the child's intellectual growth. This not only enhanced the child's functioning but resulted in additional benefits such as subtle changes in the mother's handling of her other children.

A recent and multifaceted project is that of Lally (1970) at Syracuse U. Children's Center which combines service and research. Several interlocking projects, some of which started only in September 1969, use large numbers of indigenous paraprofessionals. The goal of each project is to provide for young children and their families experiences which foster maximal cognitive, emotional and social growth. The prenatal project, for instance, starts with the mother before the birth of her child and continues as long as the child and his family are associated with the Center. Another project which includes children from 18 to 42 months is designated the "family style" program since children of varying ages live and work together in a setting which resembles that of the normal family. Preliminary evaluation has shown considerable advantages of this approach over programs which separate children strictly according to age. Some of the questions raised by Lally are: Do children participating in the combined Home-Visit-Center program show less developmental regression than those who participated solely in the activities of the Children's Center or those whose mothers only were helped? What are the advantages to the family of joining the project before the birth of the child as compared to joining it later?

Practically all ongoing interventional programs have one particular feature in common: "Experts" teach parents how to teach their children. It is the expert who imparts information, encourages the parent to encourage task orientation, better verbal communication, improved ability to postpone gratification, etc. All of these are, of course, middle-class goals and it can be assumed that they will assist children to cope better with formal education and to enable them to participate in the mainstream of the culture.

Quite a different strategy is employed by Scheinfeld (1970) who starts out with the parents' own system of values and beliefs and who works from there. In his project carried out in the Martin Luther King Family Center in Chicago, children with poor ego strength were selected from the nursery school and a program was designed for six of the children's mothers, who were interviewed as to their own ideas about child rearing. They were asked which achievements they felt were important for their children and how these might be acquired. In other

words, they were encouraged to formulate their ideas as to the basic function of the parental role. They were further asked to set priorities for their goals, and those which coincided with those of the nursery school were selected for work. Participation by the mothers in the activities of the wider community was strongly urged. In the project's last phase, entitled "Working Through the Network," the original six mothers brought to the Center an additional 22 families who in turn became part of the project. Five of the six mothers originally selected made considerable progress. The two who had done best were the ones who most strongly emphasized the importance of a sense of competence for themselves and their children. One of them decided to participate directly in the Nursery program, the other worked as president of the Parents Council. In gaining a feeling of competence in activities which fitted into their own value systems, the mothers enhanced their feelings about themselves and they projected these feelings on to their children. In the process they became more sensitive and responsive to the children's needs.

Scheinfeld formulated the conceptual framework as follows: Parents cannot construe the child's relationship to the world in ways that are fundamentally different from their own. Hence, to change child rearing practices effectively, one must change the parents' own experience.

Strategies Focused on Children

Most interventional projects revolve around the child himself. Some are based on the assumption that learning difficulties stem from a defect, dysfunction or deficit of the organism. Others rest on the conviction that children are destined to fail because--for a variety of reasons--they have missed out on some significant early experience; strategies are devised to provide what the child has presumably missed during his early development. Depending on the researcher's or educator's bias, emphasis may be on perceptuo-motor training, on language stimulation and conceptual development, on specific teaching of techniques considered essential to reading success, or on all of them combined.

In spite of fundamental differences in approaches, interventional strategies such as those discussed by Deutsch (1967), Bereiter (1966), Caldwell (1968), etc., have one feature in common: They deal with the child directly, bypassing the parent.

In the following sections a number of very different strategies are discussed, all of them designed to prepare children for effective participation in the elementary grades.

Neurological Organization

Delacato's (1966) heavily advertised approach, based on his concept of "neurological organization," is not being discussed in

detail since Masland and Cratty have taken up its rationale in another section of this publication.

What they have to say about the particular remedial strategies employed in older children applies to younger ones as well. There is no proof that activities such as "patterning" in a tonic reflex position, crawling, creeping, etc., combined with exercises to strengthen the dominant hand and to enforce monocular control "prepare" children for learning. Anderson (1965), who used Delacato's training procedures with kindergarten children, found no significant improvement in reading readiness scores in the experimental group as compared to controls. Stone and Pielstick (1969) found little to support the notion that "neurological training" benefits reading readiness at kindergarten level. The assumption that cortical dominance, important for language performance, can be modified as a result of peripheral manipulation seems to be a gross oversimplification of the highly complex process involved. The reader is referred to an excellent paper by Birch (1970) which discusses both the theoretical framework and the therapeutic claims of the Doman-Delacato position.

1) Large Motor Training

That development is by and large a consistent process which moves from primitive to more highly differentiated organizations has long been accepted [Piaget (1952), Werner (1957), etc.]. Kephart (1960) postulates that motor learning is the cornerstone of this development. Masland and Cratty deal with this proposition as far as it concerns children who already attend school. For preschool children large motor activities such as jumping, jungle gym and trampoline are both enjoyable and beneficial. They help to eliminate postural tensions; they assist in stabilizing the body for performances such as writing; above all, they give children a feeling of power over their bodies which is of importance psychologically.

There are, however, few carefully controlled studies that evaluate the benefits of such training in terms of reading readiness. Rutherford (1965) found significant gains on the Metropolitan Reading Readiness test for boys but not for girls as a result of Kephart oriented training. In the de Hirsch *et al.* (1966) study there was no association between kindergarten children's performances in hopping, balancing and throwing and their reading performance two years later. Many children with severe motor dysfunctions are excellent readers. Bibance *et al.* (1969) found that cognitive functions such as reading do not depend on level of motor development.

Kephart maintains that spatial organization--and reading is a pattern laid out in space--derives from children's awareness of parts of their body and the relationship of these parts to one another. Further investigation is needed to determine how far intensive body image training and the engraining of left to right direction in preschool children contribute to reading readiness. (See Chansky and Taylor 1964.)

2) Visuo-Motor and Perceptual Training

Reading, which is fundamentally a high-level cognitive performance, requires an intact perceptual apparatus. "Perceptual Disorders" have thus become equated with reading disabilities and many interventional strategies aim at "preparing" children for reading by working on perceptual and, in particular, on visual perceptual functions..

Basic to this are at least two assumptions:

a) That there is a sequence of hierarchies leading to higher cognitive functions and that "weakness" in one link of this sequence will result in failure to function* at more differentiated levels. This assumption represents a relatively simplistic view of the complex organization of the central nervous system and fails to take into account important mechanisms of compensation. In an interesting study Halpern (1970) describes cognitive compensatory mechanisms used successfully by second-grade children who presented visual-perceptual immaturity. Flavell (1966) maintains that there are alternative developmental paths to achieve a given product and that children may not acquire the same objectives in the same way.

b) That reading is primarily a perceptual rather than a linguistic-cognitive process. While it is true that perceptual clues play a role--particularly in the early stages of reading acquisition--they recede in importance as children get older and rely more and more on contextual and linguistic cues. Ryan and Sommel (1969) say that language processing strategies are utilized by younger as well as by older readers during the actual perception of printed material.

Perceptual strategies have their place, of course. Experiences with shapes, colors, sizes, and textures are the basic stuff of living and severely deprived, institutionalized, and above all brain-injured children may have missed out on early experiences of this kind. They need to learn to reduce irrelevant perceptual information and to filter out non-distinctive features of configurations (Gibson, 1966). Buktenica found that performances on non-verbal auditory and visual perceptual tasks combined account for 37% of the variance in predicting first-grade performance.** However, to quote Stern (1968), the

*For a discussion of sequential patterning see Flavell and Wohlwill (1969).

**Frostig (1964) identifies difficulties in eye-hand coordination, figure-ground relationships, form constancy, position in space and spatial relationships as implicated in reading and spelling disorders. Olson (1968), in a recent summary of factorial studies, came to the conclusion that the Frostig tests measure a single dimension rather

fact "that a set of variables can be shown to co-vary in a dependable relationship in a given set of circumstances does not necessarily mean that modification of one will produce a predictable change in the other." Mann (1968) points out that the coexistence of perceptual deficits with reading disorders cannot be construed as resting on a causal relationship. Both might reflect some underlying condition such as central nervous system dysfunction, or a maturational lag.

The problem of transference of learning is an old one but it is, nevertheless, crucial in the present context. There is, according to Bateman (1969), no evidence that training in a serial task, such as the stringing of multicolored beads in a given order, facilitates the recall of a sequence of letters. We do not know whether non-verbal perceptual training--in other words, training that does not involve sounds or letters--carries over into reading. Non-verbal perceptual training does improve perception, but does it improve reading readiness? Wingert's (1969) investigation seems to show that this is not the case. The children in his experimental group improved in visual perception as measured by Frostig's tests but made no significant gains on the Metropolitan Readiness instrument. Similar findings are reported by Rosen (1968), Jacobs, Wirthlin and Miller (1968) and by Cohen (1969). Jensen (1969) emphasizes the necessity of studying amounts and kinds of transfers on tasks preschool children are able to master. Until we know more about transfer, the sale of packaged perceptual materials offered for "preventive" purposes is premature.

While most normal children have no trouble distinguishing between non-verbal environmental sounds, there are many who have severe difficulties with the perception and discrimination of complex verbal sequences. According to Berry (1969), this performance requires high-order functioning. Kolers (1969) contends that sequences of letters are grouped differently by the nervous system than are sequences of simple geometric forms. Luria (1961) says that the incorporation of verbal symbols into perceptual experiences allows the child to generalize and to stabilize his perceptions. It is at this verbal level that training seems to be most useful. The tracing, copying, feeling and naming of very large letter forms seems to be more effective than having children copy the Bender Gestalten. Cawley (1968) uses series of speech sounds, graded from simple to complex, to teach auditory discrimination. In both instances verbal symbols are made part of the children's perceptual experiences, which are stabilized in the process.

than five different ones. Frostig herself is clearly flexible enough to include verbal visual material--letters and words--and auditory tasks into her training strategies.

It is, of course, true that very difficult strategies--including non-verbal perceptual training--often result in improved attention and more task-oriented behavior on the part of children. One intrinsic benefit of perceptual training, as stressed by Masland (1969) may be the necessity to listen and to process auditory information provided by the teacher's instructions and directions. Little is known about the relative contribution of specific content and more subtle aspects of training such as learning to delay gratification and to invest energy in a distant goal.

3) Oral Language Training

Ontogenetically, mastery of spoken language precedes mastery of its graphic forms. Most normal children have acquired a complex linguistic code by the time they are between 4 and 5 years old. Difficulties with verbal processing, limited vocabulary, paucity of available syntactical options, trouble with relational prepositions, inability to generate linguistic rules (Menyuk, 1969) have all been linked to reading failure. Such linguistic deficits are particularly glaring in disadvantaged children,* but they are also found in middle-class youngsters. Ingram (1968) says that regardless of IQ, the risk of reading difficulties is as high as 75% in children from advantaged homes who at age four are 18 months retarded in speech development. In determining by factor analysis the underlying abilities represented by 20 predictive tests administered to 401 kindergarten children from socially heterogeneous backgrounds, Jansky (1970) found two oral language factors that contributed to reading. The more important of them involved linguistic functioning on both the retrieval and the symbolic level (two verbal auditory tasks contributed to the factor). Such studies and the previous investigations of Deutsch (1967) and many others have resulted in a rapid growth of language-oriented preschool programs differing widely in scope, depth, and sophistication.

A survey of language-oriented projects, the majority of them directed to disadvantaged children, suggests that they can be placed along a continuum with unstructured approaches at one end and highly structured ones at the other. The word "structure" as used in this context refers to an approach which imparts a body of linguistic information in a fairly compact form, leaving little room for essential but non-cognitive aspects of experience.** This continuum refers

*Lawton (1968) says, "Linguistic underachievement is a cumulative deficit, i.e., it is a disadvantage which generates a vicious circle of difficulties increasing in magnitude as school progresses.

**Reference is made here to a monograph on Language Remediation in the Disadvantaged Child, published by Child Development Monographs, edited by M. A. Brottman.

not only to formal organization but to content as well. The most structured programs are those which focus exclusively on linguistic training, place specific emphasis on cognition, and often include reading and other academic activities in the curriculum.

Minuchin's (1968) program probably best illustrates the teaching approach at the unstructured end of the continuum. This type of intervention stresses young children's social, emotional and intellectual growth, which are believed to develop concomitantly. Like the best traditional nursery schools, her program provides for expansion and enrichment of the child's total world. Teachers offer the children verbal tools that are meaningful in terms of their immediate interests. It has been claimed that this model is unsuitable for deprived children who need a more specific and direct attack on reading readiness tasks. Minuchin herself admits that strategies such as hers require multiple criteria and cannot be adequately evaluated by increases in IQ, vocabulary, etc. Nevertheless, it is likely that her approach significantly contributes to the child's enjoyment of learning, even if this contribution cannot be converted into conventional scores.

The Pioneer program of the Institute of Developmental Studies (Deutsch, 1965) represents a compromise. There is a much greater emphasis on pre-reading and cognitive activities than is the case in the traditional nursery set-up, but these activities are carried out in the framework of an enriched environment. The child's experiential background is broadened by visits, field trips, etc.; it is in this setting that training in visual and auditory discrimination and in oral language and concept formation are carried out. One of the outstanding features of this project is the fact that the children are started at nursery school age and carried into the third and fourth grade. This results in better coordination between enriched preschool programs and the school curriculum, in contrast to most other programs which leave children with deficits to the mercy of elementary school teaching methods and fail to make continuing provision for their specific needs.

Intensity and specificity of training are outstanding characteristics at the highly structured end of the continuum. Karnes et al.'s (1968) project, for instance, which has the advantage of a teacher-child ratio of one to five, trains children three times a day for 20 minutes and stresses processes such as categorization and classification by means of games. This project claims significant advances for the experimental children as against losses for controls.

Probably the best known and the most frequently copied model, which teaches standard English as a second language* to disadvantaged

*Those programs which deal with interventional strategies for children from foreign language backgrounds are not discussed here. The relative advantages of teaching them both in their own language

children, is that of Bereiter and Englemann at the University of Illinois (1966). The authors conceive of learning disabilities as language deficits and drill the children in the use of English forms. They assume that the language of culturally deprived children is "a basically non-logical mode of expressive behavior which lacks the formal properties necessary for the organization of thought." (This might mean to the children that their own language is an undesirable mode of expression, which in the eyes of most middle-class teachers, it probably is.) Bereiter and Englemann provide highly organized and patterned language instruction combined with the teaching of elementary number concepts and early reading activities. Interspersed between intensive drill periods are language-oriented but not quite as highly structured activities. One of the great advantages of this project is the small teacher-child ratio. There is reason to accept the author's statement that the highly specific reading readiness and number training results in improved performance in first grade. (Follow-up studies are not as yet available.) According to Kohlberg (1968), early decoding and numerical transactions can be promoted by simple discriminations and associations tied to verbal labels; this might account for the success of programs such as Bereiter's. While it is by no means proven that learning a task on an associational level facilitates the learning of the same task on a conceptual plane, associative learning may be useful for coping with early academic demands.

Bereiter and Englemann's strategies, which do not encourage spontaneous verbalizations, have been severely criticized not only because the methods used tend to stifle children's innate curiosity and their drive for autonomy, but also because, as Moskovitz (1968) claims, the authors have taken a simplistic approach to a complex problem and their methodology rests on several erroneous assumptions. One of them concerns the relationship between thought and language; another is their implicit devaluation of non-standard forms of English. Such forms have a structure of their own and do not merely represent a simplified and primitive modification of middle-class English. A final objection to Bereiter and Englemann's methods is their failure to conceive of language as a process of vital communication which needs to take into account the child's affective needs at his particular developmental stage.

Of several studies designed to evaluate the relative efficiency of more or less structured approaches to language enrichment, the

and in English, as against instructing them at first exclusively in their mother tongue, have not as yet been carefully researched. Reference is here made to Horn's paper (1966). See also "Reading for the Disadvantaged, Problems of Linguistically Different Learners, Thomas D. Horn, editor. Harcourt, Brace and World, 1970.

most comprehensive one was carried out by Dickie (1968). Her design provided for one traditional enrichment program and a number of more structured ones, such as Bereiter and Englemann's and Gotkin's (1968). All training was carried out in small homogeneous groups. Results showed that all children who had participated in the various projects (both structured and unstructured) did significantly better than did controls. The only significant difference in favor of more structured approaches involved labeling in the group of children who had functioned at the low end of performance on pretesting. French (1969) in an evaluation of two contrasting kindergarten programs, one of them using a rigorous academic readiness training approach, found no significant differences between the experimental and the control group.

Summing up the evidence for linguistically oriented intervention projects, one would have to say that all children benefit from pre-school language stimulation and training. Certainly, all disadvantaged children do, and so do those middle-class youngsters whose verbal tools are poor. It is not justifiable, however, to weigh the advantages and disadvantages of specific approaches without taking into account significant variables such as length of program, parent involvement, timing of intervention, and teacher-child ratios. Differences in strategy seem to be less dramatic than one would assume. Structured programs do not have to be rigid and rely on drills, but they often are. They often fail to arouse interest in mastery for its own sake and to foster delight in learning. They may, however, have certain advantages, at least for underprivileged children. One of the most important aspects of learning is the organization of given tasks. It is entirely possible--especially in the case of hyperactive youngsters--that highly structured methods in which it is the teacher who takes over the organization are helpful for those children who have never been taught to approach a task systematically. But the goal--and this is often forgotten--is ultimately to teach children to provide their own organization as they must do in order to achieve at higher levels of learning.

Most teachers prefer structured programs because the participating children tend to pose fewer disciplinary problems than do those enrolled in more loosely organized ones. Parents of disadvantaged children, more than those of middle-class ones, also much prefer highly structured teaching approaches, perhaps because they fit better into their authoritarian ways of control.

The content of linguistic programs presents other problems. It is well documented (Deutsch, 1965) that children from deprived environments make little use of language as a conceptual tool, even if they talk fluently enough. Children who have not developed a basic hierarchy of classification and conceptual organization, children who have trouble with spatial and temporal concepts, are bound to fail in learning (Kass, 1969). Thus, most linguistically oriented programs heavily stress what is called "cognitive enrichment," the assumption being that cognitive processes are furthered by means of verbal mediation.

The development of an abstract language system to which children can turn for the solving of other cognitive tasks is the cornerstone of Blank's (1968) project. Her study is difficult to evaluate because the number of preschool children involved is very small. Those subjects who were tutored four times a week made significant gains over a period of three months, as against minimal gains by the controls, regardless of original level of functioning. The fact that the experimental children were taught in a one-to-one situation may account for at least some of the satisfactory results.

On the other hand, (Kohlberg) 1968 maintains that there exists as yet little evidence to support the notion that language training per se--essential as it is--will result in advanced cognitive structures and enable children to carry out "concrete operations" in Piaget's (1952) sense. He feels that advances resulting from verbal mediation tend to be specific rather than generalized. Learning to attach the generic label "tools" to discreet items such as hammer, nails and saw does not necessarily teach children to discover the essential characteristics and to disregard irrelevant attributes of a different collection of items. Ability to verbalize is not necessarily synonymous with cognitive processing, at least not in the early stages (Flavell and Hill, 1969). Piaget (1954, 1965) does not consider language a sufficient condition for intellectual operations.* The studies of Oleron (1957) and Furth (1966) of deaf children whose performance on classification tests showed the same structure as that of normals and appeared at the same age, corroborate this position. Vygotsky (1962) maintained that children master syntax of speech before they master the syntax of thought and that some time elapses before they learn the mental operations which correspond to the verbal forms they have been using for some time. Kofsky (1967)' found that training disadvantaged children in labeling and discriminating stimulus attributes resulted in greater attention to these attributes, but in no greater success in solving conceptual tasks. Activities such as matching, classifying, etc., do not necessarily accelerate cognition.

This does not mean that linguistic training can be dispensed with; on the contrary, it is the cornerstone of intervention. Language does pave the way for eventual high-order intellectual functioning. According to Vygotsky, the syntax of language and the syntax of thought do fuse at later stages. As a result of many years of clinical experience with both middle-class and deprived children, the author is convinced that children are indeed helped to cope with formal instruction in the elementary grades by intensive language stimulation: training in the comprehension and use

*Sigel (1969) states that the child's correct contextual use of a term is not necessarily indicative of his comprehension of that term, or an accurate reflection of his ability to understand the logical basis of the concept. The same author (1961) found that before the fourth and fifth grade, children could not define the word "brother" in terms of a common relationship.

of relational propositions; teaching of "pretending," that is to say, the shifting of frames of reference; listening to stories; grasping sequences of events; acquiring complex syntactical structures; and working on specific readiness tasks.

It is quite possible, as Kohlberg (1968) insists, that the limited increases in Stanford-Binet IQ scores resulting from training are due to attentional and verbal factors rather than to advances in cognition. However, since IQ scores are fairly predictive for success at school, linguistic training is clearly worthwhile. Improvement in attention and better verbal tools amply justify early intervention. On the other hand, it would be most unwise to make claims as to acceleration in cognition resulting from linguistic training as long as the evidence has not been carefully sifted. Exaggerated claims might lead to a repudiation of legitimate preventive measures such as help with oral language and pre-reading training, which are essential ingredients of reading readiness.

4) Packaged Programs

Many interventional projects around the country use a packaged or, what has been called a "shot gun" approach, on the assumption that a wide assortment of activities will benefit children who may have been deprived of meaningful experiences. These projects expose them to large motor, to visuo-motor and perceptual strategies, to training in comprehension and in use of language and to conceptual teaching. In the case of small children who need enrichment and stimulation in a variety of areas this is, undoubtedly helpful, although it is, of course, difficult to determine which aspects of such programs are effective. Is it the training of specific functions or do benefits result from reduced impulsivity, and better task orientation? Or is it simply the fact that the program presents the children with an organized universe they have not been exposed to before?

Older preschoolers fare less well with packaged approaches. Many of them, especially those who are "at risk" in terms of subsequent functioning in the elementary grades, need a more specific attack based on an assessment of their individual needs. Only a few programs, such as the one in Bloomington, Indiana (1967), attempt to base interventional strategies on analysis of children's weaknesses and strengths. Exposing older preschoolers who have important deficits in the language area to large motor training results in loss of valuable time which may be badly needed for filling in more critical gaps.

Approaches To Learning

The role of motivation in learning has been discussed for many years. Zigler and Butterfield (1968) believe that the IQ increases so often associated with nursery school experiences are simply the result of poor motivation during pretesting. These authors, and many others, feel that deprived children, more than middle-class ones, suffer from motivational deficits which lower their performance in formal test situations.

The operant model, based on principles of operant conditioning with behavior modification as its central feature (Evans, 1969) is not tied to specific content and appears to be successful in the case of mentally retarded or otherwise handicapped children. (Haring and Whelan, 1965; Hewett, 1968). This approach seems to work in the acquisition of relatively circumscribed skills and isolated behaviors. It seems far less effective when it comes to integrating new cognitive structures. Growth of reasoning cannot easily be interpreted in terms of learning theory.* The principle of operant conditioning has been objected to because of its molecular view of behavior. Moreover, the internalizing of positive attitudes towards learning is not fostered by extrinsic reinforcers.** The question comes up whether a far more encompassing and far more subtle mechanisms--that of identification--is a prerequisite for children to become deeply involved in the learning process. Identification implies a wish on the part of the learner to take on not only single elements but the basic attitudes of a model. It also implies that the behavior learned does not remain a foreign body as it were but that it becomes integrated in the learner's ways of meeting the world. Some disadvantaged school drop-outs who, as a result of their life experiences, have been unable to identify with a nurturing adult model do respond to extrinsic reinforcers. However, we do not know to what extent modifications achieved carry over into new situations as long as they have not become part and parcel of the individual's internalized value system.

The principle of immediate reinforcement plays an important role in the development of programmed instruction, including the use of teaching machines. Apart from immediate rewards for correct responses, this approach organizes the learning task into 'simplified sequential

*In an interesting paper, Flavell and Wohlwill (1969) point out that the Skinnerian learning model which is essentially "linear" reduces the process to the question of whether or not the child has mastered all the steps that precede, and are a prerequisite for, the concept that is to be learned. In this case, the authors say, the concept will not be learned as a general one but as a separate, unrelated entity, and thus will not transfer.

**In a recent paper Pikulski (1970) investigated the effect of three types of reinforcers on children's ability to recognize words. Middle-class kindergarten children made significantly fewer errors when given social reinforcements (praise, smiles) or just knowledge of results. They did a slightly poorer job under material reinforcement and bonus (candy). Lower-class boys did not respond as well to social reinforcement as did girls. There is no evidence to suggest that material reinforcement was in any instance superior to social reinforcement.

steps. According to Lumsdaine (1965), programmed instruction "creates an essentially reproducible sequence of instructional events and accepts responsibility for efficiently accomplishing specific change." In an exhaustive paper, Winsberg (1969) came to the conclusion, however, that controlled studies have failed to demonstrate any clear superiority of programmed instruction over traditional classroom methods. While programmed teaching might be useful for improving certain skills--and these skills might well be indispensable--it does not necessarily foster learning which involves the discovering of and the grasping of underlying principles and processes. It is difficult to accept, moreover, that in the case of very young children, and in particular in deprived young children, an approach which eliminates the very thing they most need--the support of an understanding adult they can trust and identify with--would be conducive to learning.

The impressive results of tutoring programs differing as widely as Blank and Solomon's (1969) and Palmer's (1968) are probably largely related to identification. Palmer, whose "intellective" training program of 2 and 3-year-old children is one of the most interesting projects, said: "Any well-conceived and structured program may well have equally beneficial results, provided it is introduced early enough in the child's life and an uninterrupted one-to-one relationship between instructor and child occurs . . . over an extended period of time." In a one-to-one relationship attention improves, impulsivity diminishes, anxiety is reduced--perhaps because the teaching adult who has established a warm and supportive relationship with the child "lends" him his own values: a desire to invest effort and pride in successful performance. By identification with such an adult the child slowly learns to incorporate desirable goals (see also Kagan and the psychoanalytical literature).

Timing of Intervention

The problem of the optimal time for starting intervention is an urgent one. The following questions need to be asked: Does early development provide the foundation on which later learning rests? Is severe early deprivation irreversible? Can deprivation be compensated for? Ausubel (1966), Bloom (1964), and Goldfarb (1945) maintain that the quality of early experience crucially affects development and that, as time goes on, it becomes more and more difficult to compensate for early deficits. Hunt (1964) feels that the years following infancy are the ones when adverse environments are most likely to inhibit growth and, specifically, growth of language.

Birch (1969) maintains that learning is not simply a cumulative process and that there is evidence indicating that interference with this process at specific times may result in disturbances of function that are both profound and of long-term significance. It is the correlation of the experiential opportunity with a given stage of development which is crucial. Certain basic skills underlying higher level

organization are possibly more easily generalized at earlier than at later ages (Feldmann *et al.*, 1968). In order to clarify the issue, we need detailed phenomenological observations on what happens between infancy and age three. The psychoanalytic school has collected a host of data related to early psycho-sexual development. Studies now being carried out at Harvard (Pines, 1969) are geared more towards behavioral information. We have to learn far more than we know now about the sequence of early physiological, affective and cognitive events and the specific ways they interact.

That lack of sensory-motor and affect stimulation is detrimental to growth was shown by Provence and Lipton (1962). Ability to identify probably develops very early in the child's life. Children who are not fondled and cherished may become apathetic and unable to learn. Between the ages of 10 to 18 months the foundations are laid for comprehension and use of language which depend not only on the neural mechanisms involved but also on the mother's affect and verbal communication with the child and, as time goes on, on her "teaching style."

The feeling today is that intervention cannot start early enough and that, in fact, the time to start is before the birth of the baby. The trained home visitor can assist a pregnant mother to understand her nutritional needs and seek medical and other assistance, if needed. On the basis of a relationship established in this way she can attempt to alleviate feelings of dread and despair related to the impending birth of a child the mother may not have wanted at all, and she may thus facilitate the forming of affect bonds between the mother and her infant--bonds which are essential for the child's physical and psychological survival.

Design and Evaluation of Programs

There have been a number of valid objections to evaluation procedures presently in use. Most programs use changes on the Stanford-Binet and the Illinois Test of Psycholinguistic Abilities (ITPA) scores as their criterion for change. Glick (1966) has pointed out the fallacy of first interpreting performance on intelligence tests as reflecting underlying cognitive structure and then inferring from subsequent scores on these tests that fundamental changes in cognition have taken place.

Cawley (1968) makes the important point that evaluations of interventional projects usually employ univariate means in an area where the problem to be investigated is multivariate. He insists that techniques must be found that evaluate children's progress in the various facets of each program.

Stern (1968) feels that the stated goals of intervention do not always correspond with the terminal behavior which measures change and which is usually the Stanford-Binet or the ITPA. She herself

constructed criterion measures designed to evaluate changes in the particular areas covered.

Few criterion measurements evaluate categories such as control of impulsivity, ability to postpone gratification, resolution of dependency needs, etc., although it is likely that some of the gains reported are related to such variables rather than to cognitive and linguistic factors.

Longitudinal studies are needed because in the long run judgment as to progress must be based on long-term results. Some gains might be "washed out," others will show only after some time has elapsed. Subtle changes in the child or in his environment, such as task involvement or enjoyment of mastery, for instance, are unlikely to be reflected on the Stanford-Binet or the ITPA administered only a few months after the original testing.

Zimilies (1968) states that the validity of measurement of outcome is seldom known and when it is known, it is often disappointingly low. In the place of "absolute" evaluations dominated by psychometric techniques, he suggests "operational" evaluations which inquire into the degree to which sub-goals have been affected.

Zimilies, like Flanagan (1970), differentiates between ultimate criterion measures and intermediate ones, the latter being "represented by performances and behaviors which are clearly desirable." Zimilies asks the following questions: Does the proposed form of the intervention maximize the probability of achieving its stated goal? Is the proposed mode of implementation suitable to the objectives sought? Is the statement of goals and proposed operations sufficiently differentiated according to age, developmental level and cultural background of the participating children to guide local practitioners in the development of their program?

Light and Smith (1970) discuss other highly important issues. They maintain that programmers often fail to set priorities for the various goals in single projects--although these goals might occasionally be contradictory. They object to the fact that most projects define benefits in terms of "average gains." However, variations in benefits should also be measured. The authors point out that a careful analysis of the characteristics of groups of children most likely to benefit from certain programs would enable us to direct interventional efforts specifically to certain groups. They also inquire into unintended consequences of programs which might or might not be beneficial. They point to the necessity of replicability. Above all, they want to know which features of a project are controllable and which are not.

In their excellent paper these same authors analyze program designs now in use. They criticize the two most frequently employed post hoc experimental models. In both, evaluation takes place after

the results are in. Both attempt to find out whether the average results of the experimental centers are better than those of comparable "non-centers." Among the experimental centers there are some which work well and some which work poorly. The authors counsel against using variability related to results from unsuccessful centers as "benchmarks" to judge successful ones.

According to Light and Smith the relevant question to ask is: Which program works well for reasons known to us and which of them can be reestablished in any future enterprise? It would then be possible to focus on the question whether success is more than accidental and is thus worth replicating.

Their own "sequential" model asks for the setting up of trial centers, a few at a time. Based on incoming information from these centers, it is feasible to estimate which combination of features shows the greatest promise. A second round of centers is then created with program features close to the predicted optimum combination. This cycle is continued until an effective project is attained.

This model requires time, of course, and intervention is so desperately needed that it is difficult to say whether it is worthwhile to try out what seems to be an eminently reasonable approach to the problem. The point made by Light and Smith is simply this: Using sequential evaluations and systematically adjusting and changing strategies according to new insights is far better than throwing together hundreds of stray variations only to reject them after a decade because they have major flaws.

Discussion

The development of effective educational strategies is bound to suffer unless a number of theoretical and practical problems are carefully explored.

1) Are there "critical" phases of development--Vygotsky calls them "sensitive periods"--when training and stimulation are more effective than at other times?

The consensus seems to be (Bloom, 1964; Lenneberg, 1967) that there are phases during which the organism is particularly susceptible to certain kinds of stimulation. Scott (1962) maintains that development can be modified only during periods of maximal growth of sensory, motor, cognitive, motivational and emotional structures. Prior or subsequent to such critical periods, the identical experience may have different consequences or no consequences at all.* It is essential to continue

*Hunt (1969) maintains that most researchers think of "critical" periods in terms of physiological maturation. He defines it as one

to explore the "biological timetable" (Penfield and Roberts, 1959) for specific functions. This timetable may vary for specific functions, but Caldwell (1968) argues against the frequent assumption that social and emotional factors have priority during the first three years of life and that cognitive development will take care of itself. Cognitive enrichment, if carried out perceptively and adapted to the child's affective needs, is in no way damaging to his emotional growth. A careful match between developmental level and the particular kind of stimulation offered the child at critical periods seems to be a requisite for success.

2) Do long-range gains result from interventional programs?

Much research is now going on to determine which types of intervention carry over into the school years. Lally (1970) mentions the phenomenon of "developmental regression" as a result of children leaving enrichment programs. He feels that it is only by producing changes in the parents who participate in their children's growth that such regression can be avoided.

The Institute for Developmental Studies has this to say: "The hope for instant enrichment was a vain one. . . . only by sustained, painstaking innovative action can one hope . . . to launch children on careers of fruitful learning." In the case of many children, the elementary school must continue to provide the support and the specific training initiated in interventional programs.

3) How important is the training of specific competences as compared to an expansion of the child's total world?

Training in specific skills and overall enrichment are not incompatible. The answer may in part depend on the child's social background. Structure and organization may be more urgent in deprived than in middle-class children. Drills designed to enhance specific competences, however important they may be, do not necessarily foster enthusiasm for learning, which occurs only in an environment that is responsive to young children's basic needs.

4) What size groups are most suitable for intervention programs?

Mammoth programs seem to be relatively ineffective compared to small-group teaching. According to Holmes (1961), the younger the child the greater the need for small as contrasted to large groups. There is some agreement that the smallest possible teacher-child ratio is most conducive to learning. (Roger Freeman challenges this statement

during which environmental encounters with a given kind of circumstances are especially effective in the acquisition of a given pattern of behavior.

in the case of school children (1969).) For emotionally deprived children a one-to-one situation seems to be the most promising. The effectiveness of "family-style" centers consisting of children of various ages is currently being explored.

5) Is heavy parent involvement a prerequisite for success?

Wortis et al. (1963) says that many deprived mothers are overwhelmed by feelings of depression and inadequacy. Active participation in their children's progress, will enhance mothers' feelings of being in control, a factor which Hess (1968) found to be a promising predictor of children's subsequent success or failure at school. The all-important role of parent involvement in children's overall development has been stressed by many authors (Bing, 1963; Milner, 1961; Crandall, 1960; Coleman, 1966; Lally, 1970; Scheinfield, 1970).

6) Do middle-class children need linguistic training?

While it is well known that large numbers of deprived children lag in linguistic development, the number of middle-class children whose verbal tools are poor is currently underestimated. Among the 6% to 15% of children who fail in reading, writing and spelling at the end of first and second grade, the large majority presents linguistic deficits related to a variety of causes: genetic, organic, psychological. These children, like deprived ones, need intensive help with the comprehension and use of language.

7) Are our evaluation procedures and program designs satisfactory?

They are not. Ongoing evaluation of programs is much to be preferred to post hoc tests which are dominated by psychometric techniques. The model outlined by Light and Smith (1970) deserves earnest consideration.

Recommendations

There is urgent need for massive interventional programs for culturally deprived children and for those middle-class youngsters who present deficits in areas related not only to the manipulation of numerical and verbal symbols but to learning in general.

Healthy curiosity, urge towards mastery, ability to curb impulsivity and to postpone gratification develop in the matrix of the mother-child relationship as part of the affective and cognitive interaction between the two. It seems naive to expect that the simple fact of entering kindergarten or first grade would change or substantially modify attitudes which have been deeply engrained. Intervention, involving mothers, therefore cannot be instituted early enough.

The development of a trusting relationship between a mother and an indigenous paraprofessional who would visit the home would be based on the latter's availability in terms of the mother's practical everyday needs. This relationship would allow the worker to "model" for the mother ways of handling 8 to 20 month old babies which best promote task orientation and which make for maximal stimulation and growth.*

The Child-Family Center which the child would enter at 20 months would be an organic outgrowth of the earlier home contacts.

The intimate contact of the Center workers with each child and his family would allow them to identify at between 24 and 30 months those children who showed lags in language processing. These particular children would have to be provided with intensive individual help which would be reinforced in the home.

At the beginning of kindergarten, more formal screening procedures (Jansky, 1969) would identify educational "high risks." Subsequent diagnostic evaluations of children so identified would provide profiles of individual pupils' weakness and strength and would make possible the devising of educational strategies tailored to each child's individual needs.

Those children who continued to present deficits at the end of the kindergarten year could then receive help in transition classes (de Hirsch et al., 1966) to prepare them better for the demands of first grade.

Continued reevaluation through the elementary grades is recommended.

Since results of research concerned with early intervention are not as yet fully available and since there are not enough trained people to staff these programs, it would be rash at this point to embark on a nationwide assault on early intervention. It is suggested, instead, to use the findings which are just now coming out of existing and newly established projects and embody these features in a new series of operational centers. Such centers would combine service, training and research functions in rural and urban areas involving sociologically widely divergent groups. All projects would continuously feed information into a central agency designed to evaluate strategies used in the different projects. Based on these evaluations, policies could then be formulated for a national program designed to give young children a chance to benefit from educational experience once they enter the elementary grades.

*Closed TV circuits could be used for a similar purpose.

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