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A series of discussions are reported concerning the applicability of Piaget's ideas to special education. They are contrasted and compared with other approaches to educating the exceptional child ranging from behavioral modification to the Montessori classroom. Participants included Joachim F. Wohlwill, Francis P. Connor, Donald S. Baer, Thomas J. Banta, Irving Sigel, Victor Cogen, Harold A. Selph, Mortimer Garrison, and Will Beth Stephens. An effort is made to order the various approaches according to the problems presented by the child. Interpretations concerning the specification of goals, content, process, and educational diagnosis are reported, and conclusions involve the need for continued experimental analysis of learning and its application to the classroom and for experimental teacher training programs. (Author/RJ)

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DEVELOPMENT OF A PIAGETIAN CURRICULUM
FOR EXCEPTIONAL CHILDREN

Final Report

Project No. 6-8639
Grant No. OEG-1-7-068639-0063

Mortimer Garrison, Jr.¹
The Woods Schools

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The Woods Schools and Residential Treatment Center
Langhorne, Pennsylvania
1968

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ERRATA

Page

- 4 Line 6, for "live" read life
- 20 Line 8, after "culturally disadvantage
insert population
- 29 Fifth line up, delete the comma after "task"
- 39 Line 8, for "experience" read experiment
- 41 Fifth line up, for "devine" read define
- 41 Second line up, for "discussion" read
discussing
- 43 Line 4, for "I" read If
- 45 Line 3, for "questio" read question
- 48 Line 7, for "publis" read public
- 52 To Lavetelli reference add volume and
pages: 85, 123-126.

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INTRODUCTION

The series of discussions reported herein follows from the conference on Cognitive Models and Development in Mental Retardation (Garrison, 1966). At that conference E. R. Zigler expressed the feeling that discussion of the application of Piagetian notions to problems in mental retardation was probably premature since he felt that they had not (at that time, 1964) had the kind of impact they should in the general area of child development. It was with some sense of déjà vu that one heard Wohlwill's question at our first meeting, ". . . it may sound slightly shocking, but I wonder, why would anyone want to construct a curriculum based on Piaget's ideas?" In what follows, this question will be considered at some length.

The plan of the meetings was simple. A series of closed meetings was held to which one outstanding person was invited to join the regular group for a discussion of his work and its relevance to retardation. The basic group consisted of the following:

Victor Cogen, Education Director, The Woods Schools

Harold A. Delp, Professor of Special Education, Temple University

Mortimer Garrison, Jr., Professor, College of Education, Temple University; Research Consultant, The Woods Schools

Irving E. Sigel, Chairman of Research, The Merrill-Palmer Institute

Will Beth Stephens, Associate Professor of Special Education, Temple University

The meetings were scheduled on weekends which made it possible for the group and guests to gather with a minimum interruption of busy schedules. Those who so freely shared their knowledge and experience with us included:

Donald S. Baer, Department of Human Development, University of Kansas

Thomas J. Banta, Department of Psychology, University of Cincinnati

Frances P. Connor, Teachers College, Columbia University

Joachim F. Wohlwill, Department of Psychology, Clark University

Others made material available or discussed these problems at one time or another. In particular, Gelia S. Lavetelli of the National Laboratory on Early Childhood Education, University of Illinois, made her work available to the group.

The small group made considerable interchange possible and those involved uniformly felt the meetings were stimulating. As Banta put it, "The small, informal group was an excellent setting in which to exchange intellectual biases." Since our interest was in knowing these biases and weighing their applicability to the special population of exceptional children, it is to be hoped that the biases are faithfully recorded. The participants were told that, while the proceedings were being taped, their words would not come back to haunt them.

More than is usual, misinterpretations and omissions must be laid at the door of the editor. The willingness of all involved to give up their weekends for these discussions was most gratifying, and I should like to express my thanks to all.

Mortimer Garrison, Jr.

Langhorne, Pennsylvania

1968

THE PROBLEM

We hoped to develop procedures and methods applicable to children who appear to be arrested in what has been referred to as "the twilight period" between Piaget's sensori-motor and concrete operational stages. It is in this period that "imagery arises, language develops, and the emotional life becomes clothed with images giving the resultant fantasy life." Many youngsters at The Woods Schools appear to fall into this category. Their lack of intellectual development does not appear consonant with their relatively intact motor organization, and the diagnosis frequently appears to depend on whether the child was last seen by a pediatric neurologist or child psychiatrist. Perhaps this kind of child has been most movingly described by Kephart (1960). He points out that the child beginning his school experience represents the product of a "very extensive and rapid period of learning." This period may not take place if conditions in the environment and the organism are unfavorable.

Programs in special education have only rarely been based on a specific theory of intellectual development. Piaget offers a description of intellectual growth emphasizing the importance of certain mediating processes which increase in complexity in the normal course of development. The problem was to derive a program based upon this

ground, the implication being that such a program would provide a coherent attack on the difficulties presented by brain-damaged and disturbed children.

Rationale for Using Piagetian Theory

In trying to teach a child some general principle or rule, one should, as far as is feasible, parallel the developmental process of internalization of action. That is, the child should first work with the principle in the most concrete and action-oriented context possible; he should be allowed to manipulate objects himself and "see" the principle operate in his own actions. Then it should become progressively more internalized and schematic by reducing perceptual and motor supports; e.g., from objects to symbols of objects, from motor action to speech, etc. (Flavell, 1965, p. 33).

This statement bears a surface similarity to others made by educators, and at first reading it may well be taken as the basis for the Montessori method or for the use of the Cuisenaire or Dienes materials. The crucial phrase contained in the first sentence, "parallel the developmental process of internalization of actions", requires that one be able to specify these processes.

Over the past 35 years, Piaget and his students have endeavored to trace the course of the internalization of actions from the sensori-motor level to the level of propositional thinking where the individual is freed from the primacy of immediate perception and concrete action and may deal with all of the possibilities inherent in the situation before him. The initial stages of this process have been described by Piaget most thoroughly in The Origins of Intelligence in Children and in Play, Dreams, and Imitation in

Childhood. Flavell has published the most comprehensive review of Piaget's work in English, and because of the many varied and difficult basic references, most references to Piaget's original work in this report will be taken from Flavell's review.

To date, the application of Piaget's system to problems of deviant behavior has been limited. Certain classes of behavior, e.g., stereotyped mannerisms, may be interpreted as indicating developmental arrest at the sensori-motor level. Woodward (1959) has shown that stereotypy is more frequently found at lower levels of object conservation, a finding that is compatible with Piaget's work. Inhelder (1943) gave tests for the understanding of the conservation of matter, weight, and volume to a sample of retardates and argued that her subjects could be identified as retarded on the basis of their inability to carry out the operations necessary to arrive at these fundamental concepts.

From Piaget's work it is clear that two principles emerge: 1. the student should be engaged in direct action vis-a-vis the content (Penser, c'est opérer); 2. idiosyncratic views are corrected and coordinated through social interaction. The essential questions, however, remain: ". . . by what concrete methods deriving from what theory of acquisition can we most effectively train children on these concepts?", and "How are they, in fact, acquired normally--that is, in the child's day-to-day cognitive bouts with the real world?" (Flavell, 1963, p. 377).

Laurendeau and Pinaré echo these questions when they

say, "If even systematic learning can lead only to incomplete structurings, it becomes difficult to believe that the mere fact of using problems that are closer to the child's daily experience would be sufficient noticeably to lower the age of accession to causal or operational thinking." (Laurendeau & Pinard, 1963, p. 257). They feel that the development of a child's thinking processes is mainly explained "by the progressive dissociation of the child's own self from the external world . . . that it is not a process of maturation, and requires the intervention of external pressures . . . which originate in the necessary exchanges between the organism and its physical and social environment." (Flavell, 1963, p. 377).

The direct experimental approach to the question of what causes movement from one level of structure to another has mainly involved tasks in the middle range of development as Piaget sees it (that of concrete operations). These studies by Smedslund, Morf, Greco and Wohlwill are extensively reviewed by Flavell (1963, pp. 370 ff.). In general, they represent attempts to facilitate the development of a particular concept under study utilizing techniques drawn from psychological learning experiments. Smedslund gives reason for some cautious optimism in regard to the conflict-resolution hypothesis in normal children. Haywood (1966), in a different context, notes that carefully constructed pre-school programs can significantly elevate the subsequent scholastic achievement (and I.Q.s) of initially retarded and disadvantaged children. He also cites

unpublished work by Bereiter, emphasizing the primacy of language mediation in the development of learning aptitudes in culturally deprived children, noting that overemphasis of non-verbal modes of behavior may actually be detrimental. Haywood and Tapp (1966) have argued that the importance of the quality of stimulation will vary with the stage of development of the neuro-muscular system mediating the affected behavioral system. Kirk's (1958) pre-school program and the Columbia program produced significant effects on later school performance. Whether one can, in fact, produce similar results in the children we contemplate serving remains to be determined.

Throughout his work, Piaget has consistently emphasized the developmental priority of action. Intellectual development is the internalization and representation of action in "central processes" which permit vicarious action, expand the possible courses open to the individual and speed up the sequence of events. The question we are interested in is what affects the transformation from the non-verbal to the verbal level. Piaget deals with this issue most specifically in Play, Dreams, and Imitation. The essence of his presentation is that the symbolic representation of actions precedes the social coordination of these symbols into signs having common socially determined meanings; language, in short. Successful performance on the non-verbal level must ultimately be consolidated on the verbal level frequently with the same process of errors and partial successes. "It is obvious that the representative plane equilibrium in

thinking cannot be immediately attained and the ground already covered on the sensori-motor plane must be covered again. . . . Just as the assimilation of the sensori-motor stages begins by being centered on the child's own activity, and is gradually decentered during the course of this first period of development [sensory-motor level], so reproductive assimilation begins as a process of centration." (Piaget, 1962, p. 241). Thus, success on the non-verbal level would not seem in Piaget's system to imply immediate success on the verbal level.

Programs for exceptional children have focused on motor and perceptual training thought essential for later learning; particularly for reading (cf. Kephart, Frostig, Getman, Delacato). Cruickshank et al. (1962) endeavored to make explicit the assumptions underlying their experimental program for the brain-injured child. They asserted that "learning is conditioning". Four elements were regarded as essential for their program: "1. reduce environmental stimuli; 2. reduce space; 3. a structured school and life plan; 4. an increase in the stimulus value of the teaching materials . . . to cope with the specific characteristics of the psychopathology under consideration." They tried to create an "educational environment which takes into consideration the child's psychopathology and which teaches directly to the disability." Their data are presented in a manner which makes direct comparison of changes in the experimental and control groups tedious, but it is quite apparent that there was no differential change in the experimental

group as a result of treatment in such general measures as the Stanford-Binet, Goodenough, Vineland Scale of Social Maturity, or the Stanford Achievement Test. Differences are reported in measures drawn from the Bender-Gestalt and the Syracuse Visual Figure-Background Test. These are not too convincing, but they are at least relevant to the emphasis in their methods of teaching an eye-hand coordination, motor coordination and sensory discrimination.

In the main, the methods discussed appear to represent the distilled experience of many master teachers, but it is difficult, indeed, except as indicated above, to say how theory determined methods and the choice of variables designed to measure the effectiveness of this program. In point of fact, the very time limits imposed may have prevented the experimental program from showing what it could do. (See Hunt (1961), where he describes the effects of a special program which were "not immediately evident", yet by the time the children reached the fifth grade, the program appeared highly effective.)

Fouracre, Connor and Goldberg (1962) in their project reported on a total of 190 specific curriculum items grouped under the following headings: (1) intellectual development, (2) imagination and creative expression, (3) social development, (4) emotional development, (5) manipulative development, (6) gross motor development, and (7) self-help skills. An effort was made to analyze each of the 190 items. Five levels of competency were distinguished. Each level was described, teaching procedures were suggested to establish

readiness for the next level, and the hypothesized internal behavior of the child stated. In addition to other measures of the effects of this program, each of the 150 items constituted a five-point scale with the rating being done by the teachers. These ratings, as well as a battery of psychometric measures, were used to evaluate the effect of the program.

Throughout the description of the curriculum there is an emphasis on action. The assumption was made that the internalization of actions carried out by the child led to understanding and development. "Rather than talking or telling or even showing, the teacher's role was one of assuring the activity of the individual child. Verbal telling was a summary of what had been learned, not the vehicle for teaching it." The program as a whole was also regarded as a reading readiness program, and every opportunity existed for children to move from the manipulative to the symbolic level. In many ways this emphasis on action and moving from manipulative to symbolic levels sounds much like Piaget but, except in this general fashion, Piaget's influence is hard to find in the specific curriculum items and more importantly in the "predictable internalized behavior" category where one would expect a theoretical statement to appear.

Despite the specificity with which the material is reported, it is difficult to interpret the results of this study. Where control data are available, they tend to be confused by the presence of age differences between the groups. Generally, the experimental subjects made gains

on all psychometric measures, but the significance of these for the evaluation of the program is not clear. The results of the teacher ratings on the 190 curriculum variables are presented in both volumes of the Columbia report. Mean ratings presented in Vol. I indicated the greatest gain occurred in Emotional Development, with Imagination and Creative Expression second. Least gain was shown in Self-Help and Motor Development. In Vol. II, mean ratings are presented by specific items for younger and older subjects. These data appear to indicate clearly that the younger subjects, who were the least prepared, gained the most. Put differently, the older subjects obtained higher initial ratings and made a smaller increment before reaching the limit of the scale's range. The younger group made its greatest gains in Self-Help and Social Development. The older group's greatest (though smaller) gains were in Imagination and Creative Expression and Emotional Development, which is consonant with the results presented in Vol. I.

The unresolved question is whether these general headings (Intellectual Development, Imagination and Creative Expression, etc.) would hold if the data were factor analyzed. The younger group appears to have made its largest gains on 16 of the 190 items (excluding Self-Help), of which three are from the 33 included under the heading Intellectual Development. These were: listening to oral language, participating in structure or group singing, and time concept. It seems possible that these items might well be lumped with "receiving help", "respecting property rights" from the

Social Development group.

The major finding appears to be that former project students scored significantly better than their peers on the reading subtest of the Wide Range Achievement Tests. Whether this curriculum would prove more successful than some other in a controlled test remains to be seen. The curriculum guide offers an excellent starting place for a theoretically oriented program and the emphasis on action preceding internalization could have been written by Piaget, himself.

It would seem reasonable to assume that, in order to produce a modification in the structure of thinking in retarded children, the ordinary stages of growth must be recapitulated in a more direct and extensive fashion. Piaget has not dealt to any particular extent with the question of how one is impelled to move from one stage or level to another. From this writing, one gets the impression that the dynamic is built into the antagonism between assimilation and accommodation, with each bit of experience constantly upsetting this balance, which then tends to be corrected through subsequent experience. A major shift (e.g., from the sensori-motor to the stage of concrete operations) roughly parallels the shift from manipulative to symbolic actions occurring when a child learns to use language. Piaget has discussed this in some detail in Play, Dreams, and Imitations in Childhood. Following his discussion, one might argue that the pre-verbal youngster requires experiences designed to develop the beginnings of representa-

tional thought through directed exercises in play and imitation. This is roughly the process the Columbia Study refers to in their emphasis on the internalization of actions and the development of symbols.

The problem of curriculum development then centers upon the analysis of the experiences described by Piaget as fundamental to intellectual development and a systematic and directed exposure of children to these in their appropriate sequence. This amounts to a careful reassessment of various kinds of readiness tasks and materials now existing together with the development of others appropriate to the developmental level of the child. In retarded children one may have to endeavor to teach various kinds of imitation and play before a next step is possible. It is quite possible that, for many, the kinds of preconceptual structuring described as developing through play and imitation represent the critical step which must be facilitated before the children are capable of responding to the materials shown useful in developing intuitive concepts in normal youngsters. Lacking this background, responses may necessarily be delayed until this background has become consolidated. This is to say that retarded youngsters develop more slowly than normal children but are subject to the same laws.

The complexity of this problem in the brain-injured retardate is clearly implied in J. McV. Hunt's Intelligence and Experience (1961). Hunt has endeavored to draw together what he sees as the converging lines of work in current psychological and neurophysiological theory and experimentation.

He emphasizes the work of Hebb and his students on the importance of the richness of early experience in relation to later learning. It is possible that by age 5 or 6 interruption or distortion of the regular learning sequence, whether by brain injury, severe deprivation, or emotional factors, may preclude favorable modification of behavior except as may be achieved through "training" in the sense that this term has been used above. That is, as Hunt points out, how irreversible the effects of such disruption may be is not known, but he states that there is more than a suggestion that the more important the "autonomous central processes" are in determining behavior, the more likely the behavioral deficit is to persist. Even so, it would appear sensible to expect variability in deficit as there is variability in the degree and duration of disruption. More important is the implicit requirement that effort be concentrated upon the young child.

The problem then becomes: (1) application of an educational methodology as derived from Piaget's theory of intellectual development, and (2) the evaluation of such a special program on its own terms; i.e., is there any significant increase in the complexity of thinking processes compared with a control group in a program designed for "brain-injured children with hyperactivity and for hyperactive children whose disturbance may result solely from emotional maladjustment" (Cruickshank et al., 1962).

THE DISCUSSIONS

A series of informal meetings were scheduled during which the guideposts for the construction of a Piagetian curriculum would be specified. Initially, it seemed advisable to meet with someone thoroughly versed in Piaget's thinking and accordingly the group met with Professor Wohlwill of Clark University.

Those who met that first weekend represented psychology, child development, special education, and curriculum. Their experience included research, clinical practice, and teaching with both normal and retarded children. Delp had been a school administrator; Stephens had spent a year at Geneva. Stephens and Sigel were both working with culturally disadvantaged youngsters. Such an overlap of experience, functions and disciplines seemed to offer the best possibility for a fruitful interchange between the laboratory and the classroom.

Several tendencies emerged in the first meeting which were characteristic of the later ones and which are themselves indicative of problems needing resolution. First, narrowly speaking, the topics discussed could be encompassed by three major headings: diagnosis, process, and content.

Diagnosis is the determination of what in the child interferes with his capacity to profit from experience; to what extent is this remedial, and if necessary, reversible,

and at what developmental level is he functioning.

Process is the term chosen to represent both methodology in the usual sense and the organization of experience and information. That is to say, it includes questions of group versus individual instruction and intrinsic versus extrinsic motivation.

Content refers to all of the substantive material concerning what actually went on with children; descriptions of teacher and child interaction, as well as the degree to which the Montessori materials are "programmed".

The second major characteristic of the discussions was the tendency for most of the participants to avoid discussion of how to apply specific experiments to the classroom. One sensed a willingness to talk of or to teachers about the possible usefulness of various approaches but no lessening of the broad gulf between experimental child development and educational practice. This topic of how to make theory manageable deserves further consideration.

The third tendency arose from the fact that different kinds of children were being discussed: autistic, brain-injured, deprived and retarded. The group were aware of many approaches, all of which are reported to have had some degree of success with one or another of these classes of children. As a result, considerable time was spent attempting to arrive at some overview of this complex field. The result of this discussion is a schematic diagram (Fig. 1), which represents an effort to relate the various approaches and processes discussed. No claims are made for its precision;

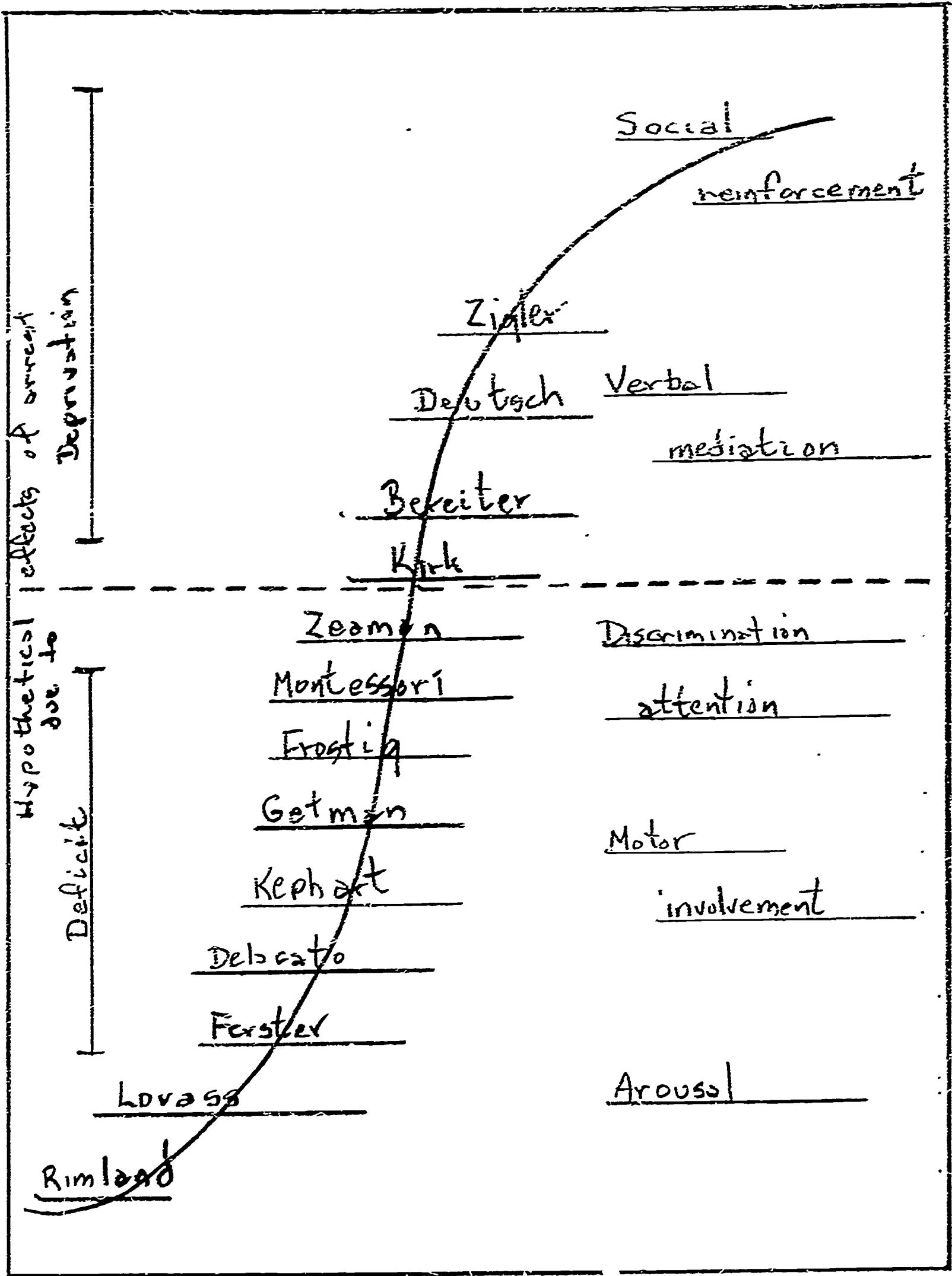


Fig. 1. Intervention efforts plotted in relation to a possible developmental progression.

it merely served as a step toward organizing our thinking.

The suggestion was then offered that it might be profitable to review some of the specialized programs in a comparative way to see what seemed to pay off with young and exceptional children. Accordingly, the subsequent sessions with Dr. Connor of Columbia discussed the five-year study carried out at Teachers College; Ronald Baer represented the behavioral modification approach with echoes of Bijou and Wolf; and Thomas Banta discussed the Montessori classes in Cincinnati and his own ingenious work in creativity. These discussions are summarized below under the headings of Diagnosis, Process, and Content.

Diagnosis

1. With Dr. Wohlwill

In this initial discussion the proposition was advanced that within broad limits there appeared to be little or no evidence to relate program effectiveness to the various available nosologies. Toward the end of our two days of talk, Sigel followed a mention of Skinner's ping-pong playing pigeons and Bruner's use of the game of Twenty Questions by saying that we had to make some assumptions about the nature of the beast with whom we were working. Earlier it had been pointed out that it makes a lot of difference whether one takes a view such as that of House and Zeaman (a lack of proper attentional processes), or a straight Skinnerian view such as Lindsley's.

With respect to the child, it was clear that in many

instances it would be obvious that a handicapping condition tended to determine strategy. (One would not play Twenty Questions with a pigeon.) Broad-gauge stimulation was not going to prove effective in stimulating a deaf child to learn language. Beyond such specific instances, there was no immediate agreement of what needed to be taken into account. Sigel commented on the tremendous variability found in a culturally disadvantaged with the ITPA. He suggested that that population was defined by residence, parental education, or race, with other dimensions such as neurological damage being almost excluded by virtue of the prepotency of the culturally-deprived concept.

Discussion of locating the child where he may be in a developmental sequence led to various questions concerning the applicability of Piaget's demonstrations for this purpose. The work of Mary Woodward, Laurendeau and Pinard, Uzgiris and Hunt were noted as being steps in that general direction. The underlying issue was whether we have adequately specified processes for dealing with varieties of learning problems and their theoretical positions and the nature of the problems themselves.

In this context, it became possible to speak of the applicability of different approaches to treatment (education) depending upon what seemed to be lacking or needed in the child. Theoretical and empirical questions then arose about the efficacy of some of the procedures and the kinds of subsystems which might have to be specified. There might be a different threshold for arousal in an autistic

child or for an affective, as compared with a linguistic system.

Diagnosis might well emphasize a different aspect of behavior than has been the case in traditional tests. An effort might be made to get at the child's capacity to assimilate and make use of information as a predictor of where an investment of effort might be made. This is something H. G. Birch has been calling for and possibly reflects a principle involved in such a test as the Hunt-Minnesota, which is based on the comparison of old and new learning efficiency.

2. With Dr. Connor

Emphasis was placed on the teacher's perception of the child in the classroom. In fact, the psychologist, pediatrician, psychiatrist, and social worker were found generally to be more of a hindrance than a help. They kept seeing problems in their own conceptual terms which were not relevant to the work that the teachers had to do in the classroom. While the specialists might be called in on specific problems, the teachers were more productive when talking to each other.

Dr. Connor felt that the Columbia methodology would be quite applicable to the retarded, multiply-handicapped child. In some children there may be some channels either closed or not available at the moment. A child with a visual-perceptual deficit will require some absolute drill, and devices were developed which facilitated this.

3. With Dr. Baer

Baer presented the position that if gaps in a child's learning could be identified, it was his task to reduce them. "I would always work on the assumption that they could achieve any level I knew how to program." While there may be limits imposed by the organism, the experimenter must act as though this were not the case. He felt that as we learn how to program more and more complex performances "we will find out what the unobserved, private processes were which led the child to it by himself."

It was suggested that the clinical description of the brain-injured child suggests that he might not be maintained on a diluted schedule of reinforcement, and that this might be a fundamental difference associated with organicity. Baer felt, however, that this was not likely the case and that if one went about it systematically an "organic" child could be taught to operate well on a thin schedule.

In a discussion of brighter and duller students, Dr. Baer responded by saying that if the difference between them was experiential, he had a chance of discovering the nature of the experiences and programming them. "If what he's got is neural or biochemical, I, personally, haven't got a chance of discovering it."

4. With Dr. Banta

The question was posed in the context of what causes a child to grow, to develop divergent thinking. Sigel responded with an analogy based on an automobile or

hydraulic model. Because of the difficulty of examining the structure, he suggested we tended to worry more about the blending and level of the gasoline (experience, information, stimulation) than we do about the nature of the machine (structure, fatigue rate, absorption level). Banta responded by pointing out that the car does not have to learn. We don't have to worry about the machine changing its internal structure in an appropriate way for what it can become.

"For a human, its internal structures are continually changing and are mobile and they lead to a higher level of functioning ultimately."

Process

1. With Dr. Wohlwill

These conversations were almost immediately put in the practical realm of the classroom by Dr. Delp's initial remark that, although some activities are likely to have to be individual if what recommended is to be realistic, "it has to be oriented toward at least small groups being together." This produced discussion concerning the use of aides or sub-professional personnel moving children in and out of groups for individual attention. Delp reminded the group that Strauss found that even as his book was published he did not have enough staff to give the amount of individual attention felt needed and that there were many aspects of education that must be handled as part of a group situation.

It was also recognized that what constituted a group was far from clear. Garrison suggested that in exceptional

children almost by definition one could expect greater variability. In a Piagetian-Kunt scaling what are the chances that a décalage of some sort will be found in one or more of the children who seem similar on one dimension or another? Some degree of flexibility was recommended so that a sub-professional person might shape one or more children after which they might then be grouped.

Stephens described children in "baby-tendas" who related on a one-to-one basis with staff, the "baby-tendas" constituting a variation on Strauss' cubicles. Cogen summarized, pointing out that these patterns were all possible and would have to vary with the type of child, the content or activity, as well as the setting. One could blend a one-to-one, a one-to-three or small and large groups into a curriculum.

2. With Dr. Connor

Dr. Connor pointed out most sensitively the reservations she and her teachers had concerning the one-to-one situation. "It forces the child to lose face; it forces him to have you imposing on him all the time." It is a matter of wooing the child and letting him get involved. As he got closer and closer "we would use his name, but not expect him to do anything. We thought of it as brain-washing and discussed it as such."

Much point was made of the fact that the teachers had the opportunity to review what was done and what it meant. "The word we used was teaching by indirection." Children were not expected to come up with immediate answers. As is

true with adults, time was allowed for absorption, assimilation, and accommodation. The average teacher's emphasis on responses is thought to stem from the teacher's need to see accomplishment and achievement. Delp commented that it is also true that the great majority of teachers teach as they were taught, not as they were taught to teach. In this context, Dr. Connor remarked that an extremely flexible, manipulative situation such as was used requires a total revision of attitudes toward instruction on the part of the teacher as well as someone on the scene to assist the teacher.

In this discussion the difference between goals and methods became fairly clear. The experimentalist or theoretician would emphasize a course in the overall conception of what it is to learn; the ordinary classroom teacher seems to look for courses in methods (teaching elementary arithmetic). Dr. Connor suggested that we are all wet in our teacher-education programs. "I would like to see more of the action settings available for the teachers as they learn. We are doing it a little bit as we have tutorials, a demonstration class or experimental class in which the teachers themselves can try out ideas." She pointed out that she had served a facilitative role with her experimental teachers. The teacher would get clues as she taught children and from this she would have another idea tomorrow.

3. With Dr. Baer

Dr. Baer's description of his work with "Susie", a non-verbal retardate, suggested that 500 to 700 hours of

individual work might produce a functional vocabulary of 200 words. This account brought such comments as, "Maybe what we need is unlimited manpower . . .", "How could we have for a dozen children the number of man-hours available to produce in each of these children the kinds of things we're talking about?", "Just to be sure the child is surrounded with programming all the time, you would need at least three different shifts of people a day."

Baer pointed out that they had only worked two hours a day with Susie and the crash program was what Lovass was doing with 16 hours per day programming. This, he felt, was working beautifully with children who have been given up as hopeless. It appeared such massive efforts would be worthwhile economically when the alternative is lifelong institutional care. However, Dr. Baer said, "I don't see any guarantee that when you did have that fairly in hand and develop the principles, that it would be apparent how to do it on a massive scale."

Dr. Delp asked what can we do in manipulating and reorganizing a program for training teachers, noting that he has 300 to 400 special-class teachers in various areas of special education. Baer replied that what it took all of us n years to learn, we are able to teach in a matter of months or a few years. Dr. Stephens made a very telling point when she remarked that it seemed possible that the special-class teacher can reinforce social behavior without having to break it down into steps and levels. Baer said that he had often wondered whether their assignment wasn't

more in the area of social development. Dr. Stephens replied to the effect that most special teachers want to teach cognitive skills but did not know how. "And I'm not sure that we can actually program the cognitive skills. I think that's the job ahead."

Baer's final comment in this area was that some kind of a machine may become the teacher's helper in areas where what the teacher wants done can be thoroughly and dependably automated.

4. With Dr. Banta

Dr. Banta's descriptions of the Montessori classes were a delightful illustration of the variability which may be found from good teacher to good teacher. One group runs the year around, starts with 2½- to 3-year-old children, who are there for three years. The teacher and two assistants work with 20 children. Sigel commented that in Detroit their teachers with an aide had about 30 children. "It's almost not the number of adults, it's the way the responsibilities are defined." Seven children would be too much if the teacher did not have help and know how to use it. He suggested that the ecology of the classroom is itself a highly germane area for study.

Content

1. With Dr. Wohlwill

This initial discussion touched on many different aspects of content without developing them. The content of this meeting really came down to the schema (Fig. 1)

previously discussed. There was a kind of polarization between the discussion of techniques or methods and the desire to state a sequence and logic which would allow the teacher to feel that "day by day in the experiences that I give them, through time, I am fairly certain that I am going to get them in the right direction."

Wohlwill cited a discussion by Baer in which Baer developed the theme that you don't really have to talk about development at all. If you persist long enough, you can always find some way of getting the child where you want him, regardless of education or particular learning techniques. Wohlwill questioned the efficiency of this approach, at least for the "normal" child, while recognizing it might be a useful approach for a slow-developing child.

He also suggested that there might be an inverse relation between vertical and horizontal progressions. "That is, the further you push a child up the ladder on one track, the less you may be achieving in horizontal generalization and breadth that may ordinarily take place in a less structured kind of experience."

Play, for children capable of it, was cited as a type of rather loosely self-activated kind of programming, which could be quite fruitful. Some of the results and descriptions of play therapy, on the other hand, seemed to make more sense if it was assumed that the child had not as yet reached meaningful symbolic play. Dr. Stephens recalled that the young (8 months to 2 years) disadvantaged children she worked with seemed to be frightened of children's toys.

In time they learned to use them. Wohlwill suggested that it may not be sensori-motor activity per se, but particular types of things that children do that give them feedback with respect to the attributes of things and space.

The goal of this behavior the type of feedback, arousal for what formed a leitmotif for this initial discussion. At one point, there was a period when the building-in of intrinsic motivation was considered. The question was raised as to whether one could not simply provide the child with experiences rather than to rework specific steps, step by step. The view was advanced that the question being raised was the relevance of teaching strategies. Either we had to stand on what the child assimilates or one could envision a developmental sequence within which differential teaching strategies might be useful. One might use a technique and so view teaching strategies without being committed to a theoretical position. Characteristically, the use of extrinsic reinforcement is "bad"; a technique is rejected because there is an aura of negativeness about it. "They read about Lovass in Life and from then on they generalize about anything that has the word operant in it . . . it violated the child's integrity."

Considering that it is the integrative function which seems to be disturbed, the problem is to take the task, set the child, and identify its antecedents. The message Piaget has to give is that there is a sequence; there are pre-requisites for subsequent behaviors. Our problem is to specify the goal behaviors and then to identify the necessary

prerequisites. It is conceivable that many children with discrimination or feedback difficulties have error compounding error as they experience continued confusion. The exercises advocated by some tacticians may not so much organize children neurologically as to provide them systematic training in learning successfully to use their own feedback.

2. With Dr. Connor

The content covered with Dr. Connor centered around the nature of the five-year Columbia study with young mentally retarded children. The initial publication had been available to some and Dr. Connor made copies of the subsequent report (with Mabel E. Talbot) available to the group.

In the discussion of what is meant by an action setting, Dr. Delp characterized it as the management of experiences so that learning results. Dr. Connor said that an action setting is one in which the physical environment contained materials which would: (a) be known, and would allow (b) an extension beyond what is known. As examples, she mentioned the act of roasting chestnuts. This was an instance in which the children could participate in the process from the purchase through the cooking to the consumption with freedom to move in and out of the situation without the teacher's being concerned about attention span, etc.

Dr. Connor recounted at some length the effort it took to overcome the resistance of some of the staff to taking these children out, letting them buy the provisions (or participate in the purchase) and ultimately letting them

make their own peanut butter and jelly sandwiches. This, too, was accomplished in a stepwise procedure and teachers afterward said that it had to be seen to be believed. The point being made was the amount of work which had to be done with the teachers in order for them to accept the possibility of certain kinds of learning experiences.

If one wished to teach size differentiation, the story of the three bears might well serve as the basis and in a host of ways, limited only by the available physical facilities and imagination, the "three" theme could be played out in triplets of different sized chairs, cups, beds, persons, etc. Similarly, if one wished to teach red, a section in which this was to be done would emphasize red, the teacher would coordinate her dress with this in mind and in every possible way structuring was used to provide a supportive environment designed to elicit the kind of learning appropriate. Materials for "unstructured play" would include red airplane, red soap dish or blue with blue, etc. The activity could be arranged so that color matches were produced at the end of the period during clean-up time.

"Juice time" seemed to be the best structure they could produce for the lower mental ages. Originally, the teachers set up but for second helpings the children in time were able to help. Initially they walked around with the teacher and were led through the process of serving. Later, it was possible to divide into small groups of four and one acted as the host. The point is that at this level through action they learned the necessary skills and

internalized the responsibility of cleaning up. At juice time different children learned different things, but generally all learned: (1) to sit quietly, (2) to discuss different things, and (3) that, although they satisfied a biologic urge, this was done with food only at the table.

They were much impressed with what could be done in affecting children's attitudes toward books. They found that children with MAs of 3 began to learn to read. They found that pictures became useful and meaningful when the child could associate the picture with color or activity. For example, a color polaroid picture of a child's mother which the child sees made. Playing with soap bubbles led to the child's understanding colored pictures on the blackboard. Pictures taken of the child with animals at the Bronx Zoo led to greater response to "pure" pictures of animals.

The child's frame of reference has to be taken into account. Going upstairs in "Goldilocks" was not meaningful for New York City youngsters, since going upstairs puts you in someone else's home.

A point was made that these children needed other kinds of communication. They were at a level where much had to be done at a pre-verbal level. They needed to be held, touched, etc.

Concerning structuring, it was pointed out that a sequence of activities was initially established. The time periods might be quite variable, but the sequence was preserved. If "free play" lasted only three minutes, there was still a "free play" period.

The use of the pool led to a need for higher structure

but also produced greater internal control, and the children talked more about it (affective and cognitive aspects appearing to continue to produce greater arousal). This activity was also highly received at home.

Time concepts started with "now" and proceeded to "after a while," etc. Benchmarks were established which resulted in the children being able to delay and to wait. The sequence of activities was as important in this as was the use of the pool. This was cited as another example of the use of external structure to produce the desired internal structuring through activity.

Dr. Connor emphasized the importance of focussing on the level of problem solving available to the child. How can you achieve goals which have relevance for him?

In the 190 items in the curriculum, intellectual items were put first since the immediate problem for the teacher was getting snowsuits off and on (activity of daily living). If this bugged the teacher, it had to be worked on. Through such activities such things as "up" and "down" could be taught. After the teacher could see the objectives, they could then focus on communication, etc.

Dr. Connor noted that conflict could occur between school values and those exemplified in the home. The children learned to cope with this through the regularity of the sequences in the school situation and through imitation and identification with the school, and teachers were able to exhibit behavior appropriate for the locale (see material about swimming pool).

A problem did exist in that the staff had to be aware that the children would ultimately go to the CRMD classes and they had to be prepared for this. Even so, the children had difficulty in fitting back into the regular classes. The teachers resented them (or so it seemed). They were too active for the rest of the class, and thus they could not help but be a disturbing element.

The materials were described by Dr. Connor as: first, the child's actions, then the teacher's, then the time and space, and finally the educational materials. The comment was made that the educational program for retarded children inevitably carries water on both shoulders because a good portion of the program is designed to produce results which will give the parents the feeling that they have to some degree the patina or some of the values of a successful child. He does sit; he does eat; he does not mess; he does not do a lot of other things. Without denying the importance of self-help in the course of this training, the child may fail to learn up from down. While he may appear to be one chronological age, the behavior which should be encouraged is appropriate to a much younger age and not infrequently both parents and teachers are distressed at such really appropriate behavior.

Dr. Sigel remarked that there is difference between our rational organization of knowledge and the kinds of apparently unrelated activities we must experience in order to master a traditional subject. "Things which seem highly distal to the goal we reject before we explore possible

relationships to it." Dr. Johnson replied by saying that, while the teacher has to know where she is hearing, the child (at least the little ones) need not have a period called "arithmetic." What he learns as he sits at a table for juice is that we have all had one glass of juice poured by the teacher. Now, we are headed for the second one, and on number two the child may pour the juice.

3. With Dr. Baer

The material discussed with Dr. Baer has to a considerable extent been published (Baer, Peterson & Sherman, 1967; Wolf, Risley, Johnston, Harris & Allen, 1967). Therefore, no effort will be made to repeat the details already reported. There was a considerable exchange on the question: intrinsic versus extrinsic motivation. The question was raised how to get children to learn for the enjoyment of learning under a reinforcement system. Dr. Baer replied that he could imagine very few behaviors occurring entirely for their own sake. "Children learn because learning is the path to reinforcers."

There then followed some discussion concerning the necessity of having concrete reinforcers available. The suggestion was offered that most children, by the time they entered school, had in fact already acquired a token reward system, however unsystematically. Thus, the teacher was already able to deal with prepared groups and to issue reinforcers. It was also pointed out that reinforcers do not have to be concrete. They can be privileges, status in a group, affection.

Dr. Stephens pointed out that a child's intellectual

curiosity just did not seem accounted for by learning or reward. However, from informal observations, intellectual curiosity seemed to Dr. Baer to be very changeable and very specific to particular interests in children. Dr. Baer commented that one of the functions of the teacher is to put a child in the position where he wants to do something that he can't do. Baer felt this led to a very effective reinforcement system as the child then learned what he needed to reach his goal.

Dr. Baer described a class of culturally deprived youngsters who were brought from second to sixth grade performance in the course of a year. The cost was about 75 cents per day per child. Using such a system as an adjunctive to the public school, it seemed conceivable that the child might end up an employed citizen. The point was made that such a procedure has the advantage of teaching the reward system on which the society is based. The educational and socio-economic systems would be congruent in an easily observable fashion. It is probably true for most of us that the better we work the better we are paid.

The question of personality development being shaped was raised. Is it possible that this is too complex a matter for programming? Baer replied that he did not feel that all the systems or traits had to be dealt with separately. "Behavior theory just in the last few years has begun to take seriously the problem of organizing behaviors into classes and we have two related concepts here: response class and functional class, which I think come down to

what might be called a personality trait.'

Dr. Stephens compared Baer's structured situation with Dr. Connor's, which she felt was based on intrinsic reward rather than extrinsic. Dr. Connor emphasized a stimulating atmosphere which implies you have to be successful rather than to have failure. She asked Dr. Baer whether his stimulating environment would support the behavior without the token reinforcement. Baer pointed to the experience reported by Bijou, Eirnbrauer, et al. (1966). When the tokens were discontinued, only something like two out of ten continued to respond.

The discussion then turned to possible ways of screening those for whom a token economy might be necessary. This seemed like an interesting empirical study with economic undertones, in view of the fact that the intrinsically motivated children would not have to be faded into a regular classroom situation.

The two approaches seemed to be typified by the statements: (1) you can only go as fast as the child is ready to go; (2) you set up in every way you can to elicit the behavior to be reinforced. Baer's statement that, as a rule of thumb, if you can't get measurable behavior change over a period of a few weeks, you must change your tactics, seems to encompass both.

4. With Dr. Banta

An effort was made to find out what constitutes "hard core" Montessori in this session. Banta said that even

though the curriculum says that the teacher is giving the child all the choices, he is interacting with the didactic materials. "That is what Montessori is all about: the proper use of didactic materials. Now, there are other components, but they share these components with every other pre-school teacher."

Dr. Stephens spoke of the order and structure to the environment in the Montessori classes she had observed. "There is an unspoken approval and disapproval between the child and the teacher." Two Montessori classes were then described. In the first, the teacher starts with structure and proceeds toward freedom; in the other, the reverse is true. Both are Montessori and in Banta's view "you can justify virtually anything except certain fundamental things like the equipment. There is error control in these materials. When a child puts the knobbed cylinders back in and winds up with one left over that rattles around in a big hole, he's told by the equipment that he hasn't done it right."

When the teacher enters the classroom, in addition to the materials which start from an extremely low level of intellectual demand, there is an approach to the child that suggests that he is not at fault for having failed to do something. Thus, the child gains a sense of competence because of the nature of the situation.

The objection was offered that Montessori and her followers think that actual sensori-motor experience promotes concept formation. Piaget holds that mental structures

have to be available for concept formation. Dr. Banta cited the example of a carefully programmed sequence leading from a circular wooden block to a line on paper normally called a circle. In the course of the graded series of steps, the child moves from the three-dimensional experience to a two-dimensional representation with equivalences being learned along the way.

Sigel cited an ongoing experience which suggested that obtaining attribute listings to develop a concept might be equally effective, at least in 5-year-olds. This, too, seems to be an experimental question.

The discussion ended with an effort to distinguish between the Montessorian and operant approaches. In both cases it was noted that outcome defines the programming with the size of the increments being the question. Banta described the Montessori teacher as trained to be sensitive to what the child is trying to do and to stay out of his way. Ideally, the child formulates and regulates his own behavior. He is dependent upon his own self-regulating and self-selection system, not upon contingencies introduced from the outside.

The objection was offered that this occurred in the use of the didactic materials where the answers are built in. The question was raised where the child gets his standards of excellence or success in ambiguous situations. After some discussion, Sigel answered his own question by suspecting that the standards for self-correction come from the child's hours away from the nursery school situation. He did not believe in spontaneous generation of self-corrective standards.

INTERPRETATION

As a result of the meetings summarized in the preceding pages, it is now possible to appreciate the size of the task stated so easily as the problem: "The derivation and application of an educational methodology from Piaget's theory of intellectual development." If one conclusion were to be drawn from our discussions, it would be to emphasize the importance of the analysis of the developmental sequence leading to the attainment of some goal. It would also appear that the critical aspect in planning remains the precise specification of the desired goals. Content then refers to the programs leading through the developmental sequences to the goals. Process refers to the technology involved, including such strategies as "teaching by indirection," reinforcement contingencies or computer displays for each child. Educational Diagnosis then refers to determining where the child may be in significant sequences and what technologies-methodologies may be necessary or most appropriate for him.

Diagnosis has long been an area of controversy between educators and psychologists. Repeatedly one hears complaints that the usual clinical examination offers few, if any, clues to the teacher as to how to proceed in the classroom. Risley (1967) extends this point saying that "procedures have been developed with echolalic children with almost every conceivable

diagnosis. . . . For our procedures the diagnostic classification of a child is largely irrelevant." In our discussions this attitude is reflected by Baer's emphasis on his developing programs for the child and in a different sense by Dr. Connor's emphasis on the teacher's perception of the child.

It may well be important to distinguish between diagnosis for the purpose of intervention and for classification. Diagnosis for intervention may have to consider whether the issue is that of arousal, reinforcing stimulus control, antecedent stimulus control (Snelbecker, 1967), verbal mediation, and the like, in addition to considering where the child is in the development of number conservation, reading achievement or I.Q. In short, there is more than a little suggestion that a functional analysis of the processes involved in learning may be necessary to identify the strategy appropriate for the child.

Aside from brief references to Woodward's (1959) work and the Uzgiris and Hunt (24) sensori-motor scale, there were few references to other diagnostic techniques. The group were very much interested in Banta's (Banta, Sciarra & Jett, 1966) test battery emphasizing curiosity, exploratory behavior, persistence, resistance to distraction, impulse control, reflectivity, analytic perceptual processes and innovative behavior. The dimensions were felt to be highly important and it seemed possible that such measures could devine some of the goal behaviors which might be subject to developmental study.

It is of some interest to note that the group seemed more comfortable discussion Banta's procedures or the effects of specific sensory handicaps than was true with the mor.

general procedures aimed at the brain-injured or the characteristics of the child described as having a learning disability. The lack of specificity and precision in the discussion seemed clearly related to the nature of the concepts and their referents. Diagnostic labels drawn from the neurological and psychiatric areas made few appearances and seemed little relevant. Sigel's comment on the prepotency of the culturally-deprived concept might be recalled in this context. It, too, is poorly defined and tends possibly to conceal as much as it reveals.

There are many attitudes and constraints in contemporary education which might be labelled prepotent. The idea that extrinsic rewards are bribery may be taken as an example. Someone remarked that he wished that education were as empirical as it was described as being. Our discussions of process may be summed up as concluding that ways must be found to afford flexibility so that children may be programmed in groups or as individuals depending upon their status (diagnosis), the content, and, above all, the goal. As an aside, there seems to be no reason why desirable personality characteristics or traits cannot be programmed along with reading readiness. Baer seemed to feel that "just enough adversity [could be programmed] so that you could be sure the child would not drop out of the whole system and [thus] demonstrate to him that adversity can be overcome."

The process area of the discussions was highlighted by Dr. Connor's comments that "a total revision of attitudes toward instruction on the part of the teacher" was needed,

and Dr. Barta's clear demonstration of the range of variability permissible within the Montessori label. The implications of the classic dictum about teaching by example come forcibly to the fore at this point. The program by which the teacher is taught does not parallel the developmental process of internalization of action, if the teacher does not have an adequate opportunity to "see" principles operating in his own behavior, it is not surprising that material is not translated from the lecture and textbook to the classroom, and, in Lelp's words, "the teacher teaches as she was taught, not as she was taught to teach."

Matters of class size, the use of a token economy or computer-assisted programs all become examples of the available technologies which may be appropriately matched to diagnosis and content. Depending upon a teacher's area of specialization (kinds of children with whom she works), she may be more familiar with the use of role-playing techniques than a token economy. The point is simply that these approaches are legitimate aspects of the educational armamentarium and their use and efficacy becomes a problem for empirical research rather than implying a philosophic conviction about the nature of man.

In order for the revisions conceivable in process to be effected, it is likely that there will have to be a considerable reorganization of the existing public school and teacher training programs. Just as diagnosis calls for a systems analysis approach, so does process.

The content area has already been summed up as consisting

of programs derived from developmental sequences associated with desired goals. What is meant by this may be most clearly defined by example. Baer (Baer, Peterson & Sherman, 1967) has published in detail the steps taken to produce motor and verbal imitation. Wolf, Risley & Mees (1964) have described the use of operant conditioning with an autistic child and Risley & Wolf (1967) have discussed the establishment of functional speech in echolalic children. Lovass (Lovass, Freitag & Gold, 1965) has described various aspects of his work with psychotic children. Bijou et al. (1966) have described their experimental classroom. In short, in many settings, with individuals and in groups, successful intervention has been reported on clearly defined dimensions in not so clearly diagnostically defined subjects.

In these examples clarity of goal and specificity of procedures are emphasized. That these are highly correlated at this stage of development goes without saying. One wonders whether Baer's "Susie," having developed a functional vocabulary, showed any changes in her play of the sort one would expect from Piaget's ideas of this is more than a "horizontal" achievement. But, as is true of many of the questions in our discussions, this is a researchable question. Such a comment only suggests that there may be limits to what may be obtained depending upon the child. The comment that roughly two out of ten of Bijou's students seemed to be able to continue to progress after the tokens were stopped is highly significant, suggesting both a diagnostic technique and a fading from an extrinsic reward system into an internalized, intrinsic one.

As a diagnostic system, one would establish a base rate on reinforcement and compare in what might be an extinction condition in the usual experimental paradigm with the question being asked whether ordinary or social reinforcement conditions found in a classroom are now sufficient.

At a different level of definition, the literature on conservation represents a series of efforts to intervene experimentally in the developmental process. The complexities of this area have recently been reviewed by Peters (1967), who points to the differences in results possibly associated with the prominence of the relevant cues and with characteristics such as those being studied by Banta. Experiments in the classroom utilizing the Piagetian model have been reported by Celia Stendler Lavetelli (1967) for compensatory education at the pre-school level and by Sigel et al.

Perhaps the basis for a Piagetian curriculum has been most clearly stated by Sigel, Roeper and Hooper (1966) when they point out that "direct training or Piagetian tasks [conservation] may be unnecessary if attention is directed to the logical precursors of specific levels of cognitive development." That is to say that training procedures should be those which give practice in the operation which must be mastered next in the sequence of development. As procedures isomorphic with "operations" are devised, tests of this proposition become feasible. Shantz & Sigel (1967) have produced evidence that the relationship of operations (classification, reversibility and seriation) to conservation varies with the type of conservation and that other methods derived from an

S-R analysis of conservation tasks also seemed to affect the development of conservation. In pointing to conservation, Piaget has called attention to an interesting problem. However, if in the course of such studies his whole developmental scheme is questioned, it will at least have had the effect of generating research on teaching strategies which may be profitable.

What of the applicability of a Piagetian approach to retardates? The studies noted above have been carried out on middleclass children in kindergarten and "culturally disadvantaged" or "inner-city" children. These approaches could certainly be used with many classes of educable retardates. The first step with both educable and trainable youngsters would be an evaluation of their stage or level along Piagetian lines in order to determine what one's goals might be.

Beyond discussions of techniques based on specific strategies, there is in our discussions a recognition of a continuity which seems to hold across all of the approaches and their organizing principles. Referring again to Fig. L., there appears to be a continuum from the basic level designated "arousal" to "social reinforcement." It is conceivable that a child suffering from an irreversible deficit may, in fact, not progress vertically beyond some level of this schema, yet may exhibit considerable in the way of "horizontal" learning which will make life easier. Discontinuity or "stages" need not be implied; rather, with learning, the effective determinants of behavior change. Perhaps one could give a probability statement of the extent to which a child's behavior is

determined by discrimination learning rather than reinforcement contingencies.

Thus, a child can be thought of as moving from a one-to-one situation, to a token economy in a classroom, to social or "intrinsic" motivation. Whether one thinks of internalized schema or not, such a view is consistent with a reinforcement approach and, in view of Piaget's emphasis on the importance of action and correction from experience, it does not seem too far removed from his ideas as well. Baer reported a small number of Bijou's students continued to learn after the tokens had stopped. One could say that they had learned "the system"; the teacher was the reinforcing agent or part of a complex reinforcing situation.

Middleclass children entering the public schools have generally learned "the system" before they enter. It would appear that disadvantaged youngsters have learned a different system by that time which is not compatible with the usual educational goals. The retarded youngster in a middleclass family may share the handicap of the disadvantaged in that "the system" does not work for him and, in fact, it is tempting to consider the possibility that those who are capable of functioning on the basis of social reinforcement are also most likely to be described as having personality problems. Such a comment implies a "defect" position with respect to retardation. But this would also appear consonant with Piaget's ideas. One would not expect to find a defect in a motivational system without finding a cognitive defect as well. "L'aspect cognitif des conduites consiste en leur structuration

et l'aspect affectif en leur énergétique. . . (Piaget & Inhelder, 1967).

As to Zigler's question about the extent to which Piagetian ideas have permeated child development, the application of programs based on Piaget appears in this country, at least, to be mainly in experimental pre-school and private settings. Even so, steps have been taken in the public schools as, for example, the Ford grant on curriculum revision to the Brentwood Public Schools, Brentwood, New York. The report by Fournier and Presno (1966) offers an orientation but on the basis of materials available at this writing the kind of specific detail required by our conclusions seems to be lacking. This task, the specific detail, appears to remain before us. There appears to be no substitute for careful, systematic, long-range studies of methods and techniques and comparisons of these. Such activities have not exactly characterized the public schools, and it will take time before changes, if they are desirable, will be introduced. In the meanwhile, the possibilities of behavioral modification are being explored in institutional settings and in special classes all over the country. These classes with "Get Set" and "Head Start" appear to be the laboratories for this kind of curriculum development.

CONCLUSIONS

These discussions started with what was thought to be a limited goal. They have led to broad considerations of the overall organization of the educational system. Recommendations are suggested or implied affecting three major areas: diagnosis, process and content. Experimental programs and demonstration programs seem both feasible and necessary if the kind of specificity needed in these three areas is to be achieved. While we cannot claim to have carried out a thorough theoretical analysis, it does appear possible to reconcile some various approaches and techniques in education on the basis that children at different stages of development require different educational methodologies, depending upon the content. There appears to be no substitute for precise statements of the techniques and the developmental sequences leading to the desired goals in the educational process. Principles applicable to children's learning also seem applicable to their teachers. There is a need for continued experimental analysis of complex learning and its application to the classroom. There is also a pressing need for experimental teacher training programs. On the basis of what has already been done, a series of empirical studies could be generated from these discussions (some of which have been noted).

In the sense of a curriculum guide as these are seen in

many school systems, there seems to be little profit in endeavoring to construct such a statement. The kinds of things found in these do not seem functional in terms of our call for specificity. In 1957 McKim (1957, p. 14) could state:

Curriculum improvement comes through answering questions in three fundamental areas. First, what does the nature of our society imply for the development of its future citizens? Second, what should be the role of the school in this development? Third, what does our knowledge of the nature of the learner and of the learning process indicate for the most effective performance of this role?

Ten years later we have not answered the first two of these questions, but we can ask whether they are even the appropriate questions to raise. Perhaps we could better suggest that the role of education is to produce optimal development of the individual, utilizing what is already known about the learner and the learning process.

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