A Prescriptive Manual for

Primary Multihandicapped Educable Mentally Retarded

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Presentations of Research

October 1975 - Presented program on "Multihandicapped Child" at State Meeting of the Bureau of Exceptional Children in Louisville, Kentucky.

April 1976 - Presented program on the "Multihandicapped - the total child" at the International Meeting of the Council of Exceptional Children in Chicago, Illinois.

May 1976 - Conducted three day workshop on the "Multihandicapped Child" at Winthrop College, Rock Hill, South Carolina.

October 1976 - Presentation on the "Multihandicapped Child" to be delivered at State Meeting of Bureau of Exceptional Children in Louisville, Kentucky.

A two day workshop is being prepared for the Project RETool for Teacher Trainers to expose them to the area of the multihandicapped. These workshops will be conducted in Kentucky in the Spring of 1977.
A prescriptive manual for primary multihandicapped youngsters was developed. The sequential developmental manual contains appropriate activities for specific learning modalities, developmental areas and parameters. The behavioral objectives are stated in terms that will enable parents to present the activities to their youngsters. The activities were adapted from activities developed by Plue (1974), Gerhard (1971), Mooney and Kedder (1967), and others.

The manual was organized so that a sensory approach could be achieved. The sensory areas of auditory, visual, haptic, olfactory and gustatory are arranged according to learning modalities. An attempt was made to identify several parameters that would aid the teacher in understanding or developing curricula for children who are multihandicapped. In some instances, the parameters listed permeated throughout the total learning modality.

Curricula areas of cognition, socialization, fine motor, gross motor, self help and language were explored. A developmental sequential guide from ages 0.1 to 5.0 years was developed. The guide was field tested and restructured to meet the needs of the multihandicapped. Approximately 600 developmental entries were established in the guide.
Introduction

As the multihandicapped youngster enters our world he faces a multitude of complex problems. As a pioneer in the field of multihandicapped one finds that there has been little or no research conducted in the area of curriculum. A general philosophy embraces the field of education that each individual should be given the opportunity to develop the autonomy and happiness that are possibilities within the range of their capabilities. Due to recent court decisions and pressure from parents of these children, the educational systems throughout the United States are faced with the problem of how best to educate the multihandicapped.

Many institutions of higher learning are providing teacher education courses so that teachers will be able to deal with the multihandicapped individual. Research on the multihandicapped is sparse. However, the 1975 National Convention of the Council of Exceptional Children showed research is being conducted and in the near future literature should be available.

The prescriptive manual was an attempt to open a door to the multihandicapped through the use of a parent-child-teacher model. Field study of the manual showed that the manual was effective with the preschool multihandicapped parent-child-teacher teams.

The researcher is especially thankful to David Schuster who served as the assistant director of the project. As pioneers in the field of multihandicapped we feel we are one step nearer the goal of "total education".
Part I Literature Review

Recent decisions have opened the door to the multihandicapped child. But the open door poses problems of providing an adequate education for each individual child.

With the advancement of medical science comes an increased number of children with multihandicaps that had previously not survived. Exposure of mothers to irradiation during pregnancy and the improper use of drugs is thought to have also increased the number of children classified as multihandicapped.

The problem which we now face is how do we prepare these multihandicapped youngsters for the public schools. The prescriptive manual for Primary Multihandicapped is an attempt to provide sequential developmental activities based on a specific learning model which will stimulate the child's development to meet his emotional, physical, intellectual and social needs.

Multiple Disabilities with Cerebral Palsy

It has been estimated that a cerebral palsied child is born every fifty-three minutes. At this rate there are about three cerebral palsied children born per thousand. Most of these children are afflicted with additional handicaps.

Many cerebral palsied children are mentally deficient. In a study on intelligence of cerebral palsied children, Heilman (1952) found that approximately seventy-five percent of the children surveyed were below average in intelligence and fifty percent were seriously retarded or mentally defective.
Many cerebral palsied children are afflicted by a hearing loss. There is also a high incidence of speech defects in them. Cerebral palsied children may have any health problem that a non-cerebral palsied child may have. This is true in the area of vision as well. When a visual problem is severe enough to be a handicap to the child, it is considered a disability. A degree of visual impairment that may not be very serious in a normal child may present serious problems to a cerebral palsied child.

Illingworth (1958) estimates that about twenty-five percent to fifty percent of all cerebral palsied children have significant visual defects.

Evidence seems to be developing which suggests that defective sensory functioning may be partly responsible for defective motor functioning and may have an effect on intelligence and perception.

M. L. J. Abercrombie (1964) did a study on perceptual impairment of physically handicapped children, of which cerebral palsied children comprised one group. He has emphasized the importance of tactile sensitivity and tactile perception in cerebral palsied children.

Defective sensory and motor functioning may partly be responsible for some educational failures.

Since most cerebral palsied children are afflicted with additional handicaps, it is obvious that a number of specialists are needed in order to accurately diagnose these children.

Multiple Disabilities with Hearing Impairment

Audiologists are able to determine the characteristics and extent of hearing loss but when the child has other handicapping conditions the process becomes very complicated. The degree to which one handicap influences the other will have various implications.
Leenhouts (1959) cites evidence from a study conducted by the Bureau of Special Education of California in which fifteen percent of the school age deaf children were classified as mentally retarded.

It is not clear what is considered the I.Q. range for the deaf mentally retarded. Myklebust (1962) stated that, "There is some agreement that when the dual problem of deafness and retardation is present, the range of normal must be altered. A person having profound deafness from early life and an intelligence of less than seventy-five percent often cannot be trained to be self-sufficient or self-supportive."

The slow-learning hearing impaired is usually considered to have an I.Q. from 80 to 90. Classes where teachers are trained in both areas are most suitable for these children.

Leenhouts (1969) makes the assumption that the I.Q. of deaf children is depressed by approximately fifteen to twenty points. Some deaf children with an I.Q. of 70 to 80 are unable to profit from a residential school for the deaf.

According to the statistics of the Annual Survey of Hearing Impaired Children and Youth from 1968 to 1972, three of ten hearing impaired children were additionally handicapped. Of these, 10.5 to 17.4 percent had cerebral palsy, brain damage or epilepsy. In the same study, 18.9 to 30.8 percent of the additional handicaps were emotional or behavioral problems.

In the field of deafness communication is the main area of concern although there are other problems involved. Because of the isolation that sometimes develops with a deaf person, he may become emotionally ill. Keeping active all forms of communication for the deaf is therefore imperative.
Alice Monaghan (1965) stated that the number of multiply handicapped hearing impaired children is constantly increasing and that educational placement for these children is becoming more and more difficult.

The hearing impaired child that is crippled or has cerebral palsy should generally be placed in a class for hearing impaired children. If his condition is such that it does not permit this, then he may be taught on an individual basis.

The emotional problems of many hearing impaired children are mild enough to permit placement in a class for deaf children. Some children may possess emotional disturbances so severe that placement in a class situation is impossible. The child may be so disruptive that it has an effect on the other children. A disturbance such as this may threaten the success of the class as a whole.

Dr. Jerome Schein (1975) stated that "the work of Lennan, Naiman and others has shown that deaf children with behavior problems are basically amenable to techniques found successful with emotionally disturbed hearing children". There will be a need to modify the material to account for the hearing loss.

If the vision of a hearing impaired child can be corrected enough to permit him to function in a class for the hearing impaired child, then placement in this class is desirable. If this correction is impossible, then the child should be taught by a teacher for the deaf-blind.

According to the Annual Survey of Hearing Impaired Children and Youth for 1968 - 1972 mentioned before; 10.0 to 16.3 percent of the additionally handicapped deaf children were visually impaired.
The adjustment of deaf-blind children is an important but difficult task. Adjustment must be viewed along with communication and learning. Lack of speech or sight, for example, causes different adjustment problems for a child.

Dr. David Tweedie (1974) stated that using behavioral observation is a good way to study subjects who are unsuitable for tests.

In a study by Curtis, Donlon and Tweedie (1975), adjustment of deaf-blind children was observed and rated on three scales: two activities of daily living, two formal learning situations, and two informal social scenes. Each activity was recorded for five minutes on tape. These tapes were then judged by ten experts.

One aspect of the research showed evidence that these children do not initiate interaction often and especially not with other children. In only twenty percent of the scenes the subject was involved as the initiator. It would appear from these data that the children are not self-actualizing; they do not seek out other people, objects or situations in the environment and initiate activities; and teachers do not work through some of the children to others.

They concluded that the deaf-blind child’s preferred way of handling his environment is by leaving it alone. He usually remains by himself not interacting with others. They must be taught to cope with their environment due to their lack of learning through life experiences.

**Multiple Disabilities with Visual Impairment**

The information regarding blind children with speech defects is limited and inconsistent. In an investigation of speech defects by Miner (1963) at the Michigan School for the Blind and the Illinois Braille and Sight Saving School, 293 children were tested and 33.8 percent were found to have some sort of speech deviation.
Disorders such as cleft palate and crippling conditions are easily detected in blind children. Many blind children have disorders of an intangible nature which are more difficult to detect. Conditions such as emotional disturbance and mental retardation are of this nature. Moor (1961) stated that many of them have been dismissed from educational programs as being too immature, not fitting into the school, uneducable, unable to talk, or in need of more individual attention.

Boly and DeLeo (1956) did a survey of fifty-two state institutions for the mentally retarded. The survey was conducted concerning educational provisions for the mentally retarded blind. There was a great variation between the institutions and limitations of educational programs for the retarded blind were noted.

In a study reported by Cruickshank (1964) on blind children in New York, 30.9 percent had intelligence quotients below 90. The intelligence quotients of an added 26.8 percent were unknown. Of these blind children registered in school districts 23.6 percent were of retarded development.

Cruickshank (1964) reported emotional problems in 28.5 percent of the blind children. The emotional characteristic of 19.4 percent were unknown. Residential schools reported 23.9 percent and day schools reported 26.1 percent of their blind children as being emotionally disturbed.

The emotionally disturbed blind child seems to function best in a residential school. The emotionally disturbed blind child presents different problems than a similar child with sight. Local day-school programs can serve these children as well.
The brain injured blind child has minimal central nervous system damage which may cause serious learning disabilities. In the New York study 2.1 percent of the blind children were reported having brain injury. Many times blind children of normal intelligence are unable to learn to read braille. These children appear to have a tactual-motor perceptual impairment seemingly based on a minimal neurological disorder.

Many of the children in the New York survey had physical defects as well. This group consisted of 31 percent of the blind children surveyed. In addition to this, 28 percent had various types of speech defects.

The types of physical defects were numerous. Cerebral palsy accounted for the largest single group, 7.4 percent. The second largest group was epilepsy which was present in 4.5 percent of the children.

In order to help these children we must begin to think of them as individuals rather than in terms of their disabilities.

Multiple Disabilities with Mental Retardation

Mental Retardation is one of the most frequent handicapping conditions found in children with multiple disabilities. Studies cited by Wolfe and Anderson (1969) indicate that mental retardation occurs in approximately three-fourths of cerebral palsied children, one-fourth of blind children and one-fourth of deaf children.

Robert A. Henderson (1960) states that the mentally retarded as a group have a rather high incidence of physical defects of all kinds including sensory and speech defects.
A diagnosis of each handicapping condition is a difficult task to perform. The more complex and involved the disabilities are, the harder it is to diagnose the child.

The variety in definitions of mental retardation is a problem in diagnosing these children. Added to this is the problem of the extent to which the physical handicap affects performance on the I.Q. test.

Studies reviewed by Wolfe and Anderson (1969) concluded that it seems reasonable to assume that approximately one-fourth to one-half of all mentally retarded children can also be considered multiply handicapped.

**Mental Retardation with Multiple Handicaps**

Based on a review of statistics on incidence of physical defects among mentally retarded children, Robert Henderson (1960) stated that the mentally retarded as a group have a rather high incidence of physical defects of all kinds, including sensory and speech defects.

A question that was brought up by Mr. Henderson (1960) was whether the child was really retarded. Limitation brought on by the physical handicaps may inhibit a child's performance on an intelligence test to the degree that he appears retarded when he may not be. He further stated that he knows of no test that has been standardized and designed to measure the intelligence of multiply handicapped children.

One problem which arises in the area of education of the multiply handicapped mentally retarded child is who is responsible for education of the child. The question debated is should it be a teacher of the mentally retarded or should it be a teacher trained to teach children with the particular physical disability.
Leland and Smith (1962) stated that the use of unstructured materials in an unstructured setting is beneficial for mentally retarded, brain damaged and emotionally disturbed children. The needs of these children seem to center in three primary areas. The first is to establish a level of self, the second is to establish impulse control, and the third is to establish social interaction. They feel that all three of these levels are best served in an unstructured situation with unstructured play material, giving the child ample opportunity to express himself.

**Physical Disabilities with Multiple Handicaps**

The purpose of testing is to determine as accurately as possible the level of intellectual functioning of a child in order to provide suitable educational placement for him. Due to the wide range of physical defects, there are no tests standardized on them.

It is important when testing a cerebral palsied child to remember that difficulties arising from the handicap may not give an accurate picture of what the child may be able to do. This is true of all multiply handicapped children as well.

Many people suggest that testing be done at frequent intervals in order to keep an accurate picture of what the child can do. He may have very different scores from one testing period to the next depending on how much he has been able to improve in any one area.

MacQueen (1966) discussed how Iowa had developed its crippled children's programs to provide help to those who are also mentally retarded. By using consultants they set up most help on a local basis.
They used mobile clinics as one way to help find these children. The clinics were made up of professionals from various social and medical fields. They could then make recommendations for these children based on their findings.

They also worked with the state institutions to help care for these children. There were some new programs developed to help care for them also. One of these programs was set up to care for newborn infants. Another program was set up to evaluate the effectiveness of speech therapy provided for retarded children in special education classrooms.

They made two important findings about adolescents and young adults. One was that many multiply handicapped persons were living at home and receiving no help. One reason for this was that they had gradually accepted defeat. The second important finding was that many of these people had physical handicaps which could be corrected by therapy or surgery but had gradually lost interest.

**Blindness with Multiple Handicaps**

Barbara Bateman (1965) stated that psychological evaluation of blind children is very difficult. It would be difficult to standardize a test for the blind due to the lack of homogeneity of the groups.

One problem which exists in the use of standardized tests is the lack of suitability of some questions to blind children. Some questions may be modified to suit the needs of blind children. In doing this we must consider what would be the effects on the validity of modifying certain questions.

It would be just as bad to rely completely on clinical judgment. When additional handicaps are added to the blindness, the process becomes even more complicated.
Barbara Bateman (1965) stated that standardized tests should be used as a place to begin which will lead to diagnostic teaching. They should be used not only to label and place a child, but to prepare a specific program for the child. The psychologists who evaluate these children should first examine their own expectations for the blind. The dangers can be just as great for one who underestimates the limitations as for one who overestimates them.

There are many problems in educating multi-handicapped deaf-blind children. One problem is the difficulty of breaking up a task into small enough steps. The steps usually taken are of little value since the distance between steps are too large.

Programs involving the multi-handicapped

An important idea in present day thinking is one of the importance of early childhood experience and early deprivation. Studies have shown that serious effects may develop from deprivation. On the other hand, remediation has been demonstrated with deprived humans. Educators feel this is one area of hope in working with visually impaired children.

Educators are now beginning to ask what is necessary to increase the probability of desirable behavior becoming established. Previously, more people were concerned with labeling the child and putting him in a specific category.

Samuel Ashcroft (1966) stated that a program for the multiply handicapped visually impaired child should be clinical in nature and on a one to one basis. The program should be conducted toward the learning problems of the child. These should be determined by diagnosis made by a multidisciplinary team. The parents of the children should also be involved in the process.
Our goal should not be a "cure" of the problems but rather to help the child function at the highest level possible for him.

In a study reported by Steve Mattis (1965) the hypothesis that concept deficits are the primary disruptive factors in multiply handicapped visually impaired children was used. The program was centered around developing concept formation. An example of a concept that was taught is shape.

Mattis (1965) stated that in developing an individual treatment plan it is necessary to determine the sensory and response modalities best developed by the child. Some children may perform best by using auditory cues and a vocal response while another child prefers a tactual cue and a motor response.

The education that has usually been provided for blind children has been directed toward those who have average or above average intelligence. Due to the increase of mentally retarded blind children, it is necessary to provide an adequate education for them also.

A new approach was initiated in summer sessions at the Michigan School for the blind. The children who attended those sessions had only one thing in common and that was their visual impairment. All of them had other handicapping conditions. Each child was given a complete physical, mental and psychological examination. At the end of each session, the entire staff took part in making recommendations for the child.

The studies have shown that if special treatment is given multiply handicapped blind children at an early age, a large number may be habilitated enough to enter either day school or residential schools.
Curtis (1966) reported that in evaluating verbal performance in multiply handicapped blind children, it is essential to use a multi-disciplinary approach. The child must be evaluated in ways other than intellectual and social age alone. Many people are involved in the evaluation process.

The child is examined by three speech pathologists in separate rooms. After careful examination educational recommendations are made. It is important to remember that it is difficult to probe in depth into the problem areas of multiply handicapped children. Their level of functioning is usually so low that it easily leads to frustration.

There is currently an Infant, Toddler, and Preschool Research and Intervention Project directed by Diane D. Bricker going on. It was made possible by grants to George Peabody College for Teachers and John F. Kennedy Center for Research on Education and Human Development.

It currently serves seventy families of which thirty do not have retarded children. Parents and children are referred by pediatricians and others coming in contact with a child that does not seem to be developing normally.

The project is composed of five units. The first unit is the Coordination Unit and is responsible for administrative matters. It also coordinates social services for the family and psychometric assessments of the children.

The Infant Unit is composed of infants from six to sixteen months who indicate developmental retardation. These infants are evaluated for sensory motor development. The program is then structured to work on the particular deficits of the infant.
The Toddler Unit is made up of children between eighteen and thirty-six months. There are retarded and non-retarded children making up this group. The purpose of this is to provide normal development models for the retarded children. This unit has two separate classes which meet each day.

The Preschool Unit concentrates on preparation for public school admission. It is felt that retarded children with no previous experience will not do as well as those who have had this training.

The final unit is the Parent Training Unit. This is where the parents are trained to help their children at home. The success of the program depends partly on whether the parents do their part. If they fail to do this, then the success will be limited.

There is little literature concerning communication difficulties of auditorally impaired mentally retarded children. Glovsky and Rigrodsky (1963) reported a study to teach lip reading and language training techniques to these children. The children were first taught to recognize their own names through lipreading. They were then taught to copy, write and recognize their names. The next step was to learn to recognize the names of the other classmates. After this, they were taught to recognize words of things in their environments in the same way.

A project similar to these was carried out with diagnosis and treatment of preschool children at the Kennedy Study Center in Santa Monica, California.

The children were under four years of age and demonstrated a deficit in two or more of the following areas: motor, adaptive, language and/or personality. Careful evaluations were made of each child by several professionals. The child's family was also evaluated. A conference was then held regarding each child and recommendations were made.
The group met two hours twice a week. The children were worked with individually and in a group. The mothers met in a group for counseling also. They usually remained in the group about ten months and then graduated to various programs depending on the one best suited to the child's needs.

Stewart and Coda (1960) stated that it seems certain that early diagnosis and treatment have contributed to a better understanding and adjustment of the multihandicapped child and his family and also increased the opportunity for maximum development of the child's potential.

Another early education program for multihandicapped children is the Early Education Project in New York City directed by the United Cerebral Palsy of New York Inc. The physical environment of this project is modeled as much as possible after a typical preschool setting. The equipment and facilities are modified to meet the needs of the handicapped children. The environment was designed to be used safely by handicapped children.

There is a team of specialists who work closely with the teacher to help care for the needs of each child. The teachers of the classes have had experience in working with nonhandicapped as well as handicapped children.

Several observations are made when the child enters in the program to determine his strengths and weaknesses. Then they develop goals for each child and ways of achieving them. The recommendations of the team are translated into daily activities for the child which are divided into small components so as to afford a successful experience for the child.
Social interaction is quite limited for many multihandicapped children. Because of this, many activities of individual children can be incorporated into group activities to try to foster social interaction.

An important factor in this project like many others, is the importance of parent involvement. One way that parents are involved is a five day summer conference.

It is felt that the age of two is quite late for intervention. The sooner the education is begun the greater the chances for success.

A study on nonverbal communication in severely retarded cerebral palsied children was reported by Hagen, Porter, and Drink (1970). They felt it was more realistic to teach a severely retarded cerebral palsied child a nonverbal mode of communication due to the little hope of his learning to communicate otherwise.

The children were taught to use a device by which they could communicate their wants and needs through a code. All the children learned to use the device in various degrees.

By using this device the children were able to communicate their basic needs and feelings. This allowed them to interact with their environment at will and not only when someone else chose.

Dr. James Tawny (1974) at the University of Kentucky has proposed an alternative strategy for educational intervention of severely retarded children. It is called Programmed Environments for the Developmentally Retarded.

His set of alternatives is based on the premise that classrooms should provide a high rate of teacher-child interaction, having instructional content and ensuring the probability of correct response from the child.
He says educators who develop programs must keep in mind that there is no systematic, organized content of instruction for these children.

Robert Frisina (1967) reported that with hearing impaired children we must go beyond the mere testing of these children. Something must be done with the information obtained. He feels the diagnostic evaluation must be considered in the terms of the code for input, the code for storage and the code for output.

The code for input refers to the information outside the individual and how he deals with these sensory stimulations. Frisina (1967) stated the code for input is seen to consist of two components. The first relates to the quantity and quality of environmental stimulation available to the individual; the second involves the anatomical and resultant physiologic status of the input transducer we know as the end organ of hearing.

The first refers to the type of home life and environment of the child. The second refers to the amount of damage to the hearing of the child.

The code for storage of verbal information is made possible by the central nervous system. Inner ear breakdown can interfere with adequate perception of verbal stimuli.

The third code is the code for retrieval. The physical, biological and behavioral sciences are relied on in this area.

Each of these areas should be considered in a diagnostic evaluation of the hearing impaired child.
In former years the education of multi-handicapped children has been very poor. But since 1948 the number of handicapped children receiving special educational services has increased tremendously.

In the 1800's there were some residential schools for the deaf, blind and retarded, but there was no institution to compare with New York City's Center for Multiple Handicapped Children. This center deals with children who have various physical and mental problems.

One reason for the increased concern for handicapped children is because parents have organized and pushed for education for their children. Recent court decisions have made it imperative that every child have an education. If it is impossible for the child to attend the regular school, the system must provide or pay for alternative schooling.

Mainstreaming means to integrate handicapped students into regular classrooms with normal children. Mainstreaming does not merely mean putting a handicapped child in the classroom. It means identifying the individual physical and academic needs of handicapped students; assessing their possible readiness for integration on either a full time or part time basis; preparing the mainstream schools for the students' entry; and providing all backup services required, including resource teachers and facilities.

There are several mainstreaming programs currently going on. One of these programs is the Madison Plan used by the Santa Monica Unified School District. One of the developers of this plan is Dr. Frank Hewett of the University of California at Los Angeles.

There are many problems associated with mainstreaming. One of the main problems is training teachers for such classes. Very few have had training in working with multihandicapped children.
Edward Martin (1974) stated that if these children are to be mainstreamed, teachers must concern themselves with not only instruction of these children but also with dealing with them emotionally.

This should be a major concern in the development of educational prescriptions for the child.

One of the most important questions a parent of a multihandicapped child asks is what will happen to the child when the parent is no longer able to care for him. Most parents feel mere institutionalization is not adequate.

Long term care means more than just a place to live. It is a way of life that is meaningful whether at home or away. Parents want provisions to care for their children and make their lives happy and full. They do not just want to see that their child exists.

Helsel (1965) referred to the multihandicapped as "the group with moderate to severe physical handicaps plus some degree of mental retardation". They all have the common problem of being unable to care for themselves independently.

When possible these persons should stay with their own families. When this is not possible, other alternatives must be sought of which institutional care is but one.

Helsel (1965) stated that whether a person lives at home or away, day-to-day planning of activities must be part of the care. The plans should take into account the capabilities of the individual.
Part II A Prescriptive Manual

Bloom's Cognitive Domain progresses through knowledge to evaluation sets, and can be thought of as hierarchies of learning area development. Each set has the possibility of deriving sequenced activities through task arrangement.

Similarly, Guilford's "Product" arrangement, Piaget's and Erikson's stages, and others, Gagne (1965), Valett (1967), and Simpson's taxonomy (1966) are to be interpreted as developmental.

In using a developmental concept for this Guide, and in reference to the suggested learning model developed (see Figure 1), it is apparent that a structure needs to be applied to each learning mode: receptive, cognitive, and expressive. To do this, the writings of Larson (1968), Gerhard (1971), and to a lesser extent, Schiefelbusch (1967) have been adapted to provide a realistic educational form to developmental tasks.

Receptive language may be envisioned as perceptual. It is widely noted that our basic information is received through our senses, and generally, five areas are considered in perceptual learning:

1. Auditory -- relating to hearing
2. Visual -- relating to seeing
3. Haptic -- relating to consciousness of muscular being and touch
4. Olfactory -- relating to smell
5. Gustatory -- relating to taste

Activities useful for primary multihandicapped educable mentally retarded will be described in the manual. So that consistency can be maintained, activities will be organized under learning modalities with stated objectives, sequential enabling activities, and suggestions. Each will indicate suggested levels and developmental areas, and will be followed by selected references and material possibilities.
Abbreviations:

LM - Learning Modality (e.g. visual decoding)
DA - Developmental Areas (e.g. similarities - differences)
L - Level (e.g. preprimary, primary)
P - Parameter (e.g. discriminating)

Sections to be included are as follows:

Receptive Language
- Visual decoding
- Auditory decoding
- Haptic decoding
- Olfactory/Gustatory decoding

Associative Language
- Basic Cognition
- Convergent Operations

Expressive Language
- Motor Expression
- Verbal Expression
- Visual Decoding

Definition: The primary multihandicapped educable mentally retarded are defined as those children with a WISC I.Q. of 50 to 70 who also have deficits in one or more of the following areas: auditory, visual or motor to the extent that they cannot be served within the regular classroom or by an itinerant teacher.
The Conceptual Model:

The fact of individual differences is well known in the field of education. We cannot treat this fact as if such differences were all the same. They are not! Nor should educators, or others interested in the learning disabled child, be satisfied with any attempt that remotely suggests all children are from the same mold.

While several learning models are in vogue, the simple S-O-R model seems to encompass, in general, most theoretical stances. The S-O-R model, as presented here, is simply a way of indicating known dimensions of learning.

A major point of agreement is that for learning to take place something happens to the learner (S), that something occurs within the learner as a result of the stimulus (O), and that either an overt or covert response is made by the learner (R).

That the stimulus (S) is important to learning may be evidenced by the large emphasis placed upon media, audio-visual aids, and the multitude of sensory type materials (commercial and teacher made) designed to use the senses as facilitators to learning. The implication is that the human object of such encoding receives messages provided there is an acuity for reception.

Internal processes (O) in learning are well known and utilized by educators. It is concerned with the processes that lead to responses. There are at least two implications for instruction growing out of the cognitive position. One is that continued search for the basic patterns of what is to be learned should be continued, and such structures placed in appropriate forms so they may be presented and comprehended by children. This is essential for children who are multihandicapped so that they may utilize, in a meaningful way, what they receive.
Figure 1—General Learning Model: A Concept for Multihandicapped

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<tr>
<th>RECEPTIVE (S)</th>
<th>COGNITIVE (O)</th>
<th>EXPRESSIVE (R)</th>
</tr>
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Acuity

(S)  
O - Olfactory  
G - Gustatory  
H - Haptic  
V - Visual  
A - Auditory

(O)  
C - Convergent  
D - Divergent  
Com - Compare  
Assoc. - Associate  
Mem. - Memory

(R)  
Mot. - Motor  
Ver. - Verbal

Signifies Development
The second implication is that teachers should show children the most expeditious manner of acquiring basic structures and accompanying content based upon their knowledge of the child. The teacher is the most experienced person in the educational setting and should be aware of individual "styles". With the teaching materials presenting content and strategy, the teacher might perform more as a clinician in assisting with individual learning problems.

The responding mechanisms (R) have always been a way of evaluating children. How children write, speak, and perform have given a means for judging behavior. One of the major contributions of response learning has been to focus learning objectives to procedures which will elicit behaviors to meet specified objectives. The notion that learners tend to repeat performances that are positively reinforcing to the individual is well known. The "doing" of tasks is an important feature of learning and many curricula designs are based upon this concept. It is further suggested that responses may serve as a "feedback" system to encoding and cognitive learning modalities. As one becomes more proficient at a learning task, adapting performances are made.

Accordingly, a conceptual model would include these areas as basic learning areas. Several names have been given to these by different authors, but most would agree that the S-O-R formula is common enough to be recognized. Assuming acuity (the ability to receive stimuli) the following can organize the S-O-R formula into a better perspective:

<table>
<thead>
<tr>
<th>Receptive Language</th>
<th>Decoding</th>
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<tbody>
<tr>
<td>Input</td>
<td>Perceptual Learning</td>
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<tr>
<td>Visual, Auditory, Etc., cues</td>
<td>Receiving</td>
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Basic senses receive stimuli through eyes, ears, touch, nose, and tongue which lead to individual perceptions from low to high levels; thus separate into multiple learning channels.

![Diagram of learning channels]

Learning styles include the organization of perceptions and "feedback" data into several types of cognitive thinking. Differential responses are made through one's ability to associate, compare, memorize, collate, and sequence his perceptions. Memory, associative, and comparative abilities are considered basic learnings (although each could be short, intermediate, or long term in nature) which lead to more complex styles may be thought of as convergent or divergent (Guilford 1967, and others, has listed more, such as concrete operations, etc., but this conceptualization includes these in the two mentioned.)

![Diagram of convergent and divergent thinking]

Individuals respond and learn by performances made. We tend to evaluate children by how they write, draw, throw, run, say, talk, and generally express themselves. Many review their performances and revise newer expressions as they are made. This forms a "feedback" system to the learner.

![Diagram of expressive learning and feedback]

Expressive Learning
Output
Expressed Behavior

Expressed Behavior

Encoding
Performance Learning Response

Motor
Verbal
In all, the above can be combined into a learning model which will tend to indicate most stances in the learning field. This is shown in Figure 1.

Figure 1 is an attempt to suggest possible areas of educational concern as well as the dimensions of learning. It must further be recognized that developmental aspects and categorical parts should be included in this model.

By using this simplified model, it is possible to account for some of the defined terms associated with the multihandicapped individual who is educable mentally retarded. In doing so, it succinctly illustrates some of the confusion surrounding the multihandicapped field.

PARAMETERS:

Not only must the educator be concerned with learning modalities and developmental factors, but also the various parameters (parts) that comprise each modality. Such parameters, however, are not altogether clear and many certainly do not stand the criteria of valid research. Pockets of research, literature, theory, test items, and a host of commercial materials and programs suggest, however, that educators must be aware of the "parts" of any learning modality. Further, it is quite possible, in fact probably, that all parameters have not been identified at the present time.

An attempt will be made to identify several parameters that might aid the teacher in understanding or developing curricula for children who are multihandicapped and functioning at the educable mentally retarded level. In some instances, the parameters listed may permeate throughout the total of a learning modality. Frostig (1964) suggests that "form constancy" is one aspect (parameter) of visual perception which could be conceptualized as similar at all developmental levels. Other investigators...
and authors have indicated conceptualizations in several learning modalities which discuss like "parts" related to learning.

Of the samples that follow, parameters are placed on areas of seemingly most influence. Further, there is no suggestion that each necessarily exists in isolation of other learning channels or parameters. In the suggestions that follow, they should be viewed as possible areas of emphasis in which a primary educational concern may be evident. The parameters that will be listed in the Guide are somewhat advisory and may not stand the test of known factor analysis. Further, each channel, visual, auditory, haptic, etc., may need different sets of parameters. Someday perhaps, research will help us find, specifically, these answers.

**RECEPTIVE LANGUAGE PARAMETERS**

A. Discriminate-identify relationships between and among cues.
   - form
   - detect
   - color awareness
   - shape
   - weight
   - context
   - texture
   - stereognosis
   - recognition (detail, outlines, images)
   - temperature
   - hardness

Example: Here are some visual cues: $A, A', a, \bar{A}, a$

(They are all a's but are also different. Discrimination allows us to detect relationships).

B. Adjustment-manipulating cues to a criterion reference.
   - space distance
   - arranging sizes
   - intensity (soft-loud)
   - magnitude
   - matching
   - locate
   - amplification
   - inflection

Example: Here is a problem in visual cue matching. Which symbols /cues are the same or similar?

```
e   b   a
a   x   y
```

Adjusting allows one to match the a's as the same according to criterion reference.
C. Recognition—attachment of meaning to a cue (s).

- figure ground
- constancy
- sequencing
- location
- tension
- relax
- pressure
- rhyme
- dialect
- closure
- identify

Example: Which of the following visual symbols means a question?

#  1  ?  ;

Which of the following is a word?

zug  use  kow

D. Relating—attaching connectors with cues.

- tracking (following)
- sensitivity
- pitch

Example: Given the sound of OH, which shows excitement? Question?

OH!  OH?

E. Selection—choosing a cue.

- hue
- brightness
- saturation
- position in space
- depth perception
- simultaneous selection
- body parts
- muscle contraction
- manipulate
- localization

Example: Where is this sound coming from? Near? Far?

F. Distribution—arranging clues to some criteria.

- ordering
- categorizing
- relationships (position in time)
- integration
- integration
- incomplete forms to complete
- scaling
- forms
- context
- blends

Example: Arrange the following to make a word.

RNU = RUN

The amount of factors associated with Receptive Language is huge. Some are connected with parameters and others are interwoven in development or both. The educator should be aware of these factors, with the understanding that, to date, they are not sequenced or fully identified; however, curricula activities may be build around time. A partial listing, as they might relate to specific areas in Receptive Language is included below:

**Auditory Decoding**

Awareness of sounds: that there are sounds of different kinds; some are similar; some are not.

Detection: The notion "sounds come from something."
Auditory decoding Cont'd

Attention to sounds: paying attention to one, or a group of sounds and not to others, or to no sound.

Amplification: basic acuity; how does it register.

Constancy--Consistency of Sound

Discrimination--note different pitches, tones, frequencies, and differentiate among them.

Intensity--loud vs. softness

Figure background--one, or a few, from many or several; selectivity.

Inflection--emphasis on parts of a whole sound. Oh! Oh!

Dialect--idiomatic patterns of sounds including contractions; noting these.

Blends--receiving parts of whole sounds.

Patterns--flow of sounds, time.

Selectivity--picking out and relating sounds

Identification--grouping

Discrimination--sounds parts of whole

Matching--noting more than one decoding variable two different drum beats are from drums

Localization--where it comes from, or what

Directionality--dealing with up, down, within, etc.

organize--grouping auditory variables

Sequence--ordering auditory variables

Manipulate--using auditory variables

Context--placing auditory variables

Comprehensive--understanding auditory variables but usually single sound perception

Listening skills--understanding a variety of auditory decoding messages

Organizing--grouping a variety of auditory decoding messages
Verbal Expressive Parameter

Verbal expression parameter is a study in and of itself. The body of knowledge in this area includes articulation and language development. The examples below are an attempt to simplify a few parameters found in this area, and emphasize responding, ordering, and expanding.

A. Respond— to emit sound

say a, a, e, oo
accent
articulate
intonation
inflection
imitation
rate
length

B. Order— sequence sound into an appropriate pattern

sentence formation— closure
syntax
plurals
verbs
associations
transformations
active, passive
phrases
clauses
formation
order

C. Expand— elaborate sounds

tell
sentence/paragraph building
vocabulary
stabilization
Ordinate movement includes the refining of efficient control in performance of motor tasks, e.g. more precise movements. This includes the elimination of extra and wasteful movements. Of concern is the adequate manipulation of space and appropriate performances under more complex, or unique, conditions.

Adapting movements would include the utilization of options, the combining of these, and the initiations and development of movement tasks.

A. Generic Movement—operations or processes which tend to facilitate the development of human movement patterns.

- identify and do positions
- copy movement or static performances
- demonstrate a softball throw
- strength and power
- endurance
- responding to puffs of air
- up and down
- responding
- walking
- crawling
- balance
- holding
- grasping
- locomotion
- maintenance
- pushing
- pulling
- static
- speed

B. Ordinate Movement—meeting the requirements of specific movement tasks.

- toss a ball to a specific area
- swim across a pool
- monitoring
- propulsion
- draw lines from different points on paper
- relaxation
- agility
- releasing
- catching
- balance
- laterality
- directionality

C. Adapting Movements—the modification of performances in skills to meet specific task demands.

- utilize two or more skills to perform a task
- run in several different ways
- flexibility
- manipulation
- direction
- coordination
- space orientation
- matching
- investigate
- versat lity
- gesturing
Associative Language

In Associative Language, or Cognitive, no attempt will be made to break the areas into discernible parts. A short discussion, however, would seem worthwhile.

Parameters surely are involved in cognitive functions and one might speculate that someday this will be done. A few samples are conceptualized below, but there are not exclusive and should be viewed only as possible representative samples.

Cognition

Auditory memory—retaining impressions; to recall sound patterns
Auditory integration—(synthesis–analysis)—to collate a variety of independent sounds to form aural unit; new or established
Auditory closure—to fill in the missing part
Auditory association—interpret and sort; sound to object and touch
Visual selectivity—grouping from several cues
Visual imagery—associative to criteria
Visual associative—interpret and sort; object to sound or touch
Expansion/Contractive—generalization on the basis of function, position, action, and social need

Expressive Language

In order for the child to indicate he has learned, he must perform in some manner. He does this by expressing himself motorily, gesturing, writing, running, or by vocally saying something.

In motor expression, three kinds of movement seem apparent and may be thought of as parameters.

Generic movement would include the recognition of position, postures, patterns, and skills with utilization of our senses and cognition; imitation through deplication; and arranging (patterning) and use of the body in ways to achieve a movement skill.
Proximity--clearness to, with, etc.
Location--finding
Matching--parts to a whole in space
Sequence--ordering
Relationships--one symbol to another
Identifications--understanding symbols
Missing Parts--parts to a whole
Understanding--utilizing symbols
Reproduction--recall of symbols and manipulation
Scaling--value placement
Concept--understanding visual symbol cues
Syntheses--putting together

Haptic Decoding Parameters
Recognition--different kinds of touch, awareness
Contraction strength--potential
Sensitisation--feel, stimulation force
Identification--discriminating a variety of decoding
Messages--texture, shape, form, weight, temperature, hardness
Arranging--organize
Sequence--ordering, placing
Matching--manipulation, matching, arrange size
Body Parts--placement
Distance--estimating, space
Location--finding
Stereognosis--object manipulation
Gesture--non-verbal decoding
Transduction--use of decoding messages
Abstractions--understanding decoding messages
Manipulation—using a variety of auditory decoding messages
Comprehensive—understanding a variety of auditory decoding messages
Directions—understanding of
Grouping—understanding the emphasis or point of auditory messages
Generalize—understanding concepts of auditory messages
Comprehension—understanding questions and reactions
Semantics—meanings

Visual Decoding
Detection—noting visual cues
Discrimination rate—responding time wise, picking out
Matching—basic similarities and differences
Closure—formation and arrangement
Symbol recognition—identify, size
Classify—noting details
Structure—formations
Intensity—relative brightness, clearness, saturation
Pursuit—following a variable
Copying—relating to transfer from one decoding variable to another
Similarity—closeness of visual cues
Sequence—arrangement
Tracking—pattern following
Matching—noting two or more visual variables or in conjunction with other decoding variables
Perspective—relationship to other cues
Position—place
Relations—relationship of one variable to another
Depth—nearness, farness
References


