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## Adapting the Montessori Approach to Moderately Handicapped Children

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ADAPTING THE MONTESSORI APPROACH TO  
MODERATELY HANDICAPPED CHILDREN

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A Thesis  
Presented to  
the Graduate Faculty  
Central Washington State College

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Education

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by  
Mary E. Crosier  
August, 1968

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APPROVED FOR THE GRADUATE FACULTY

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## CHAPTER I

### THE PROBLEM AND DEFINITION OF TERM USED

Maria Montessori developed her method originally for culturally disadvantaged children. Since then, a great deal of the application of her method has been with normal children in private school situations in various cultures. The problems that have occurred in adapting the Montessori exercises of practical life, the sensorial training, and reading in a public school class of moderately handicapped children will be dealt with in this paper.

#### I. THE PROBLEM

##### Statement of the Problem

This paper is meant for the public school special education teacher of moderately handicapped children who has had some teacher training in the Montessori method. It is not the purpose of the paper to prove the Montessori method, but rather to show how some of it could be adapted for use with moderately handicapped children of primary school age.

Of particular concern was a special education class in the Richland (Washington) Public Schools. There were twelve children from five to ten years old. The group consisted of seven boys and five girls.



Their handicaps included cerebral palsy, brain-damage, emotional disturbance, mental retardation, and social deprivation. Some of these children were new in special education; some had been with this group several years; and a few came from the first grade or kindergarten of the regular school. Few of these children had had much success with academics or socialization before this time.

The report discusses (1) the basic characteristics of the Montessori method; (2) how the Montessori method teaches the exercises of practical life, sensorial training, and reading; (3) how these areas of learning were adapted for moderately handicapped children; and (4) the progress the pupils made in a year-long application of this approach.

### Importance of the Study

Most special education teachers seem to be looking for ways to improve their program (4:14). When a new method is found, it is usually geared to normal children. Heck points out,

This revamping of the methods of instruction presents a challenge to the initiative and originality of the special teacher. Many general suggestions are available, but the specific, concrete illustrations that are needed for instructional purposes are less frequently put into written form (1:354).

This paper shows some concrete and specific suggestions for teachers of moderately handicapped children to follow when the Montessori method is used.

## II. DEFINITION OF TERM USED

### Moderately Handicapped

Most authors agree that a moderately retarded child ranges in

I.Q. between 50 and 65. Rosenzeig and Long describe this child:

The ability to make self-evaluations and to do autocritical thinking is seriously impaired. They are capable of attaining second or third grade levels of academic competency although their verbal and written communication is marked by a poverty of ideas. They learn almost exclusively from firsthand experiences and even then there is need for many exposures. Reaction time is generally slow and as a result they are inclined to perform poorly on timed tests or in competitive activities. . . . Muscular coordination is poor and general clumsiness is evident. (16:16)

The group in this report was classified as moderately handicapped children rather than moderately retarded children because not all the children were retarded. However, each child did have some type of handicap that impaired his learning ability.

## III. LIMITATIONS OF THE STUDY

This report will be confined to children in a special education class in Richland, Washington, who were moderately handicapped and were of primary school age.

The essential features that the writer attempted to convey were concerned with the Montessori exercises of practical life, the sensorial materials, and the reading materials. The reading materials used were centered around the Initial Teaching Alphabet (i.t.a.).

Another limitation was that the teacher had access to only a limited amount of the Montessori materials.

#### IV. ORGANIZATION OF REMAINDER OF THE THESIS

In Chapter II, some characteristics of the Montessori method are discussed, and more specifically, the methods Montessori used in teaching the exercises of practical life, her method of teaching sensorial training, and her method of teaching reading.

In Chapter III, the writer discusses how Montessori's methods in practical life experiences, sensorial materials, and reading were modified to work with a group of moderately handicapped children in Richland, Washington.

In Chapter IV, a general report is given on some of the progress seen in the pupils. Also, some conclusions are listed in that chapter.

## CHAPTER II

### REVIEW OF THE LITERATURE

Most of Montessori's basic method was used in the classroom reported on in this paper. However, the writer found that various modifications had to be made. Specific emphasis was placed on the areas of practical life experiences, sensorial training, and reading. More emphasis was placed on these three areas because they are key areas in a good Montessori program. This chapter discusses some basic and fundamental characteristics of the Montessori method, with particular emphasis on the above-named areas.

#### I. CHARACTERISTICS OF THE ORIGINAL MONTESSORI METHOD

The Montessori method is based on a prepared environment for children from two and one-half years of age through high school. The prepared environment contains various apparatus and didactic materials for carrying out exercises of practical life and for learning sensorial and cognitive skills. Orem describes the Montessori method as ". . . a spontaneous expansive educational system designed to afford the child liberty to move and act in a prepared environment encouraging self-development" (14:13). The child is allowed to concentrate upon self-chosen tasks.

Some major characteristics of the Montessori method as seen by Naumann and Parson are:

1. Montessori education is based on children's natural stages of development and on each child's normal needs to learn certain skills at specific stages. Children learn individually by exploration, guided discovery, and spontaneous repetition.
2. The Montessori teacher is mainly a sensitive child-study specialist trained in the meaning and use of didactic materials and in continuously organizing the "prepared environment" for effective and enjoyable learning.
3. In this safe and orderly environment each child learns naturally and freely at his own pace and developmental level. Freedom of behavior comes as a normal result, along with a sense of responsibility and respect for others. About thirty children are considered a group of normal size. Each group should have children of different ages, e.g., 2-1/2 to 7 years, whose mental abilities may range from subnormal to superior.
4. There are many didactic materials for individual learning experiences in the various areas of child growth, such as the apparatus for training of the different senses, materials for learning geometry, arithmetic, grammar, geography, and other subject matter. Through well-designed exercises the child becomes proficient in the areas of practical life skills, sensorial training, cognitive development, art and music, physical behavior and social living.
5. Each child's working place, e.g., table or floor mat, is absolutely respected as private and may be shared only on the child's invitation.
6. A child may pick up only one set of learning materials at a time from the easily accessible shelves and has to return the set in proper order. The learning materials have self-instructional characteristics and were developed in years of empirical research.

7. Though there is essentially full individualization of learning experiences, the children also learn by observing each other and by helping one another. A demonstration lesson by the teacher usually introduces a new skill or activity to a group of pupils, but this is done in a quite effective way, different from the commonly used method.
8. Socializing group experiences evolve naturally and are then encouraged.
9. Music and art are normal parts of Montessori education. The Montessori music materials easily lead the young child to enjoyable and independent creation, including the development of his own tunes.
10. Montessori education, particularly for younger children, is a comprehensive educational system based on a definite philosophy concerning children and their developmental needs. An open-ended design keeps the system receptive for experimentally-based modifications (13:5-7).

As has been pointed out, the Montessori method is a complete system of teaching. However, this paper is limited to Montessori's exercises of practical life, sensorial training, and reading.

## II. EXERCISES OF PRACTICAL LIFE

The Montessori exercises of practical life were all those areas concerned with the practical experiences that a child must endeavor to get along by himself and in society. The practical life activities include: (1) care of self, (2) care of the environment, indoors and outdoors, and (3) social relation skills.

Montessori emphasized cleanliness each morning when the children arrived at school. The teacher examined the children's hands, nails, necks, ears, faces, and hair. (It should be remembered that the first Montessori school was in a slum housing project.) She also examined their clothes to see that they were buttoned and snapped properly, and to check that they were not torn. Montessori provided a washing stand with small pitchers of water, a basin, towels, and a nail brush. (See Appendix A for washing lesson.) She suggested, however, that the children practice pouring rice before they attempted to pour water.

Montessori gave each child his own comb so that he could care for his hair. Dressing frames were provided so the child could learn to tie, snap, and button.

Each child had his own apron for painting or any other activity that might cause the child's clothes to get soiled.

A broom, dust pan, rags, and dust cloths were provided for the children to keep the room neat and clean. Montessori showed the children where to clean first, then later left it to them. All utensils were child-size, but realistic and solid for use.

The children were taught to keep every object in a specific place in the room, thus assuring material order.

Montessori's children were free to move about the room, but so as not to disturb other children. Only during the "silence game" were they totally quiet. (See Appendix B for lesson on silence.)

The children in Montessori's class ate their lunch as a group at school. They were taught to set a table correctly, to serve the food, and to wash the dishes.

Common courtesy and conversation were taught while the children were eating their lunch. Montessori encouraged the children to have respect for one another and to use such words as "yes, thank you," "excuse me," and "please." She also encouraged her children to use pleasant conversation while eating. For example, she encouraged them to discuss their meal, and perhaps a birthday party they might have had.

Montessori's practical life experiences laid the ground work for a well organized classroom. These activities led into the care and use of the sensorial training materials which will be described in the next section.

### III. SENSORIAL TRAINING

The sensorial materials were developed to aid in educating the perceptual and cognitive areas. Each piece of material had a



correct place and a correct use. Many of these materials have a built-in control of error which showed the child his own mistake. The materials were designed so they could be easily handled by a small child.

Standing states, "It is not so much to give the child new impressions as to give order to the impression already received" (18:30).

The sense of hearing was taught by using the "sound boxes." The child learned to discriminate between loud and soft sounds. Next, he learned to match the sounds in the boxes. Lastly, he put the sound boxes in order ranging from the loudest to the softest sound.

The sense of taste was taught by having the children put various solutions on their tongues, such as sweet and sour. After the child had used the solutions, he was shown how to rinse his mouth.

Different types of flowers were used to aid the child in his sense of smell. Montessori suggested that it was fun for the child to be blindfolded and put two different types of flowers under his nose and have him identify them by their smell.

The touch boards were an aid in teaching the child the sense of touch. The child learned "rough" and "smooth" through the use of sandpaper boards. The child then learned to match various touch boards and to grade them by degrees of coarseness.

Training in visual perception was initially provided through the use of the cylinder blocks. The child could see into which hole a

cylinder fit. As the child progressed in this skill, he was allowed to do it blindfolded. Then he had to use his sense of touch.

The sense training skills that Montessori used were the ground work for the cognitive skills that would follow. For example, the touch boards led into feeling the sandpaper letters and numerals, which later led into writing. Another example were the red rods. These rods subsequently led to the number rods, which initiate the child to basic arithmetic skills.

The sensorial materials also contributed to the child's language development. He learned words like rough, smooth, sweet, sour, thick, and thin.

Only a few examples of the Montessori sensorial training materials are mentioned here. Many additional materials were involved in preparing the child for subsequent cognitive skills. (See Appendix C for sensorial training materials.)

#### IV. READING

Dr. Montessori taught reading by the use of the phonetic approach. She presented several sounds, then showed the child how these sounds could be made into a simple word.

Sandpaper letters were designed and put on cards about 3 by 5 inches. The vowels were on blue cards, and the consonants on red cards.

The child was taught to trace a letter with his forefinger and middle finger (the same fingers used in writing) and to say the name of the sound. Two or more letters at a time were taught by the use of the three period lesson. (See Appendix D.) After the child had learned three sounds, such as "m," "a," and "t," Montessori showed him how to put the sounds together so that they made the word "mat."

The sandpaper letters were kept on an easily accessible shelf. When a child wished to work with the letters, he would ask the teacher to help him. (He also might have asked another child, or the teacher could have offered to help him.)

After the children had learned most of their sounds, they would begin to use the "large movable alphabet." This alphabet consisted of the same letters cut out of red and blue cardboard. The letters were in a partitioned box with eight like letters in each partition. With this movable alphabet came a small pink box of simple objects. Each object was a three-letter pure phonetic word, e.g., bus, mat, hat, bat. A child would place the movable alphabet in front of him and choose the letters that made the words of the objects in the object box. To accompany this activity, other small pink boxes with pictures of three-letter pure phonetic words with matching word cards were made available. (All three-letter pure phonetic word boxes were colored pink.) The child laid the picture cards out and placed the correct word under the corresponding picture.

As the children progressed, blue boxes were made available in the same method. The blue boxes contained phonetic words with four letters.

Next came two smaller movable alphabets, each with one distinct color. These alphabets were for use with words that contained difficulties. For example, some of the difficulties might be the "ar" sound, the "ch" sound, and the "sh" sound. Each difficulty was isolated for a separate green box. A green box would contain either pictures or objects of just that difficulty. When the child spelled out the word using the small movable alphabet, he put the isolated difficulty in a different color. For example, in the word "ship," the "sh" would be in one color, and the "ip" would be in another color.

After the children had learned most of the difficulties, Montessori presented many reading activities and games. One of the activities was a name box. That box contained the names of the children in the room. The child went to each of the other children and placed his correct name on him. Another reading activity was one with word cards of objects in the room. A child would take each card and place it next to the object. Words such as "chair," "mat," "rug," and "plant" were used. Montessori next used command papers. These slips of paper had such phrases as "open the door," and "get a box."

After this, Montessori introduced grammar. The children learned nouns, adjectives, verbs, and all the other parts of speech. Within this context the children learned how to compose their own stories.

Montessori's original reading was in Italian. She made many observations and tried many methods before she devised her reading program. British and American Montessori teachers had to make some revisions to adapt her reading methods to meet the standards of the English language.

The Montessori sensorial training materials were a direct link to reading. The sensorial material trained the child's eye-hand coordination so that he could be better prepared to handle the reading materials.

## CHAPTER III

### PROCEDURE

#### I. EXERCISES OF PRACTICAL LIFE

The exercises of practical life were taught in the Richland (Washington) special education classroom essentially as Montessori taught them. It was felt by the teacher and the administration that these particular children had to become as independent as possible, and that they had to learn to be acceptable in society. The exercises of practical life were particularly important, because these children did not seem to be able to care for themselves.

A specific time period for practical life experiences was not provided for these children; rather, the teacher took full advantage of every practical life experience that occurred and tried to capitalize on it.

When the children came into the room each morning, the teacher asked them to put away their lunches and coats. They were then asked to go to the bathroom and to wash their hands. That way, each child began the day with clean hands for handling the equipment. After recesses, and before and after lunch, the children repeated this process. The idea of going to the bathroom and washing had two purposes. One was to teach cleanliness; the other was to keep the children from going

all the way down the hall to the bathroom without supervision during school time.

A washing table was provided for the children in March.

Before this time, the children practiced manipulating two small pitchers containing rice; i.e., pouring rice from one pitcher to the other, an activity suggested by Montessori. After several months of this, the rice was replaced with water. The pouring activities were necessary for the cerebral palsy children and any other child who had difficulty with muscular control. The teacher made sure the children who needed to work with these activities did it.

When the washing table was presented, the lesson in Appendix A was shown to the group. After this, the teacher explained the important points for the children to remember. These points were: (1) pour the water carefully and use only a limited amount, (2) wet your hands, (3) soap your hands on both sides, (4) rinse your hands, (5) dry your hands, (6) empty and clean the wash basin. If the children followed these directions, the teacher said nothing to correct them. However, if the child played in the water or made a mess, he was asked not to use the washing table until he could use it correctly. In this case the child was shown the procedure for washing hands again, before he could use the table. The washing table was not used a great deal, because the children were asked to wash in the bathroom each time they came indoors.

The table was used primarily after painting, polishing shoes, or cleaning the room.

The shoe polishing kit was another practical life activity that the children shared. It was a regular commercial shoe polishing kit. The cloths and brushes were labled, "white," "black," and "brown," so the child would be sure to use the correct ones. The first lesson was taught to the whole group while the teacher demonstrated with her shoes. The activity was performed by the teacher sitting on a mat with a large piece of paper placed under the polish and the shoes. The teacher wore a smock. The children were expected to follow her example.

All the children ate lunch in the regular school cafeteria. They had their choice of bringing their lunches or buying a "hot" lunch. This was not conducive to serving food and setting tables, but it did serve as a good opportunity to learn table manners. The children came into the cafeteria, got their lunches and milk, and sat down at a special table. The teacher appointed a girl and boy to be hostess and host for each day. The host and hostess were the last children to be seated at the table, and when they began to eat, the other children followed. When the children finished their lunches, they took their plates or sacks and emptied the left-overs. The host and hostess cleaned the table. The children then went out to play on the playground with the children from the regular classes.



Valentine, Christmas, and Easter parties afforded the best opportunities for teaching table setting, serving, and washing dishes.

Montessori did not teach cooking, but the children referred to in this report seemed to need the experience; therefore, the teacher had the children cook something before each of the parties. For example, at Christmas, a Christmas tree cake was baked; at Valentines' Day, Jello was made; and at Easter, pudding was prepared. The children made biscuits, cornbread, and butter at other times. A kitchen and all the necessary kitchen supplies were in the room next to the children's classroom. If the teacher wanted the children to cook, she traded rooms with the other teacher.

The cooking lessons were done as a group project. Every child was given a job. Some children did the cooking, some set the tables, some served, and some did the clean-up work.

The teacher took advantage of birthday parties as opportunities for teaching practical life skills. The child who had the birthday was responsible for the party. He was given the choice of either doing it all himself or appointing other children to help him. At these parties each child had a cupcake or cookie, napkin, Kool-aid and/or juice in a paper cup. The treats were furnished either by the mother or the teacher. The child would first pass the napkins, then the cupcakes or cookies, then pour and serve the juice or Kool-aid. After everyone was finished,

a wastebasket was taken around. It was left to the individual child to clean his own table.

The lunch period, cooking lessons, and parties gave the teacher a chance to teach the social graces as Montessori suggested.

The teacher taught the children to move quietly, similarly as Montessori taught this. However, this was not too strongly emphasized since there were three orthopedically handicapped children who could not be expected to move as quietly as the others.

At the end of the day, each child was asked to help clean the room. For example, the shelves had to be dusted and straightened; the mats and rugs had to be made neat; the dirty water from the pail at the washing table had to be emptied, and fresh water had to be brought in for the next day; and the plants had to be watered. Montessori expected her children to do these jobs during the day, and she did not give them a specific period for it. This particular group seemed to be quite careless; therefore, a specific period was provided for clean-up.

In this section, it was shown how some exercises of practical life experiences were handled in the special education classroom. Only the necessary modifications have been pointed out here. Otherwise, the practical life experiences were handled in the same way as Montessori described it (11).

## II. SENSORIAL TRAINING

This section will include the modifications made in teaching specific skills with the Montessori sensorial materials.

The sensorial materials were perhaps of major importance to this group of handicapped children, as they seemed to need a great deal of work on eye training, coordinating hands and eyes together, and also learning to concentrate.

The teacher taught the smelling and tasting activities only when opportunities presented themselves. If tasting solutions had been provided for these children, they would have drunk them rather than tasted them. When a child did mention smelling an odor of some kind, the teacher discussed it with him. She discussed whether or not it was a good or bad odor and sometimes the children tried to guess what the odor was. For example, the children tried to guess what they were having for lunch by the smell that came from the cafeteria.

The sense of taste was taught at lunch time or during cooking experiences and at parties. The teacher again discussed with the children whether it was a good taste, bad taste, sweet taste, bitter taste, or a sour taste. She did this purposely to build the children's vocabularies and to make them more aware of taste.

Nearly all these children had difficulty with sight and coordination. The teacher was limited to only a few Montessori sensorial materials. She also felt that the children needed to work with more materials than Montessori provided, so she developed some on her own. For example, she provided a box full of many different bottles with different types of lids. The children were asked to take the lids off the bottles, mix the lids, and replace them on the correct bottle. This activity forced the child to use both his hands and eyes.

Another activity for visual acuity and coordination was a tray with three sections. Peas and beans were mixed in the large section of the tray. The child then put the beans and peas separately in the other two sections.

The children practiced cutting with the use of a cutting box. A pair of left-handed scissors and a pair of right-handed scissors and some plain paper were in the box. As the children learned to cut better, paper with lines or simple designs was put in the box.

A large weaving loom was made for the children. The loom was the same size as the top of the children's desks. Large strips of colored cloth were made to go with the loom.

The children were also provided with a sewing box. This box consisted of commercial sewing cards. The sewing cards could be used many times. Later in the year, an embroidery set was provided. It

contained all the necessary equipment and some simple patterns for the children to embroider.

A tracing box was provided for the children. There were simple pictures in it. These pictures were mounted on cardboard and outlined in felt pen. Tracing paper was found in the box. The tracing paper, which was the same size as the mounted picture, was placed over the picture. The child traced the picture with his crayon. After the tracing was finished, the child could color his picture if he wished. This exercise again forced the child to use his hands and eyes together.

The teacher had three sets of metal insets. One set was used for naming the pieces, one was used for tracing and filling in, and the last set was used with the geometrical cards. There was no geometrical cabinet, so the teacher chose the cards and insets that matched, put them in a box, and placed them on the shelf.

Each of the materials mentioned above was individually presented to a child. After the teacher showed the child an activity, he was free to work with it on his own time. The child was never allowed to work with a material that had not been presented to him.

The teacher found that she had to select and suggest the materials to these children. They did not seem to be aware of what their needs were until they were told. In a sense, these children were not given as much liberty as children in a normal Montessori class.

### III. READING

The i.t.a. reading program caused much of the modifications that were made in reading. Even so, a few modifications of the Montessori reading approach had to be simplified. It was also necessary for the teacher to use a reading text, therefore more modifications had to be made.

The first modification that was necessary was to change the shape of the sandpaper letters so that they were i.t.a. symbols rather than the regular alphabet. The color of the cards were changed, too, because this alphabet had to be used with deaf children along with the moderately handicapped children. The cards were yellow for all nasal sounds such as "m" and "n". The blue cards were used for all the unvoiced sounds such as "t" and "s." All of the rest of the cards were red.

Montessori made only one set of sandpaper letters and placed them on the shelf for the children to use whenever they wished. This teacher found it more effective to give each child his own letters. She started the child in Montessori reading by teaching him three sounds through the use of the three-period lesson. These three sounds were placed in his envelope until the next day. If he still remembered these sounds the next day, he was taught an additional sound. This was done

each day, until the child had learned all forty-four i.t.a. sounds. The teacher checked the child's sounds daily. This was usually no problem, because the children were highly motivated to get a new sound.

After several of the children had learned ten sounds, the first i.t.a. movable alphabet was presented. This was done because the Montessori reading method and i.t.a. were compatible at this point. The alphabets were divided into four separate sets because a box with forty-four sound symbols was too large for the children to handle. The smaller boxes also made finding the correct sound symbol easier for the child. The first sound symbol box and corresponding object boxes were colored pink. This was done so that the child knew on which set of sounds he could work. The second set was blue, the third set green, and the fourth set was white.

The transfer from large sandpaper sounds to small, plain sound symbols seemed to be too great for these children. Therefore, these symbols, too, were made out of sandpaper and placed on the corresponding colored card. The card, however, was cut around the sandpaper so that it, too, was the shape of the letter.

The children needed a great deal of practice in reading activities. The teacher made reading more fruitful and interesting by presenting fruitcake cans containing objects. This was done along with Montessori's traditional object and card boxes. There were also boxes of toy

furniture separated according to rooms in the house. The pieces of furniture had matching word cards. The boxes contained a kitchen with such objects as a sink, stove, and a refrigerator. There was one for the bedroom, one for the living room, and one for the bathroom. The matching cards were in white with black letters for the more advanced children.

The small movable alphabet for word difficulties was eliminated. This was done because i.t.a. does not have the inherent pronunciation or spelling difficulties of the traditional alphabet.

The rest of the reading program followed Montessori closely, except that teacher-prepared books were added and the children were not expected to compose their own books.

The first books used were the McGraw-Hill Sullivan series. These books were torn apart and the pictures placed on large tag board. The i.t.a. writing was done in felt pen below the picture. The purpose of the felt pen was to help the children see the large print.

The teacher then tried the regular i.t.a. reading texts with the more advanced children. This proved much too difficult for them, because they had to take time to sound out every word, and the vocabulary advanced too rapidly. The children soon lost their interest in this reading. The next step was to get old Scott-Foresman books, tear them apart, change them to i.t.a., and put them in loose-leaf



notebooks. This was done because the loose-leaf notebooks were easier for the children to handle than the tag board. This program had far better success, and was also the beginning of the transfer to regular reading. The reading books were presented to small groups of two or three children. However, most pupils still needed individual guidance.

Many reading games were devised for the three slowest children. They most often met as a group. They worked with some type of game to encourage their interest.

The i.t.a. reading program which was used, was strict because the program was teacher directed and programed to each child's needs. The children were free to progress at their own level without the competition of others, but the teacher had to work with each child to help him with his basic skills.

## CHAPTER IV

### SOME RESULTS, SUMMARY, AND CONCLUSIONS

#### I. SOME RESULTS AND SUMMARY

The purpose of this section is to show what effects a modified Montessori approach had on a class of moderately handicapped children in Richland, Washington.

The modifications that were made in the exercises of practical life seemed to help these children. Previously, these children had not adequately taken care of themselves or the things in their environment. They expected the adult to do it for them. Therefore, relevant parts of the practical life activities were modified. Montessori felt that children would care for themselves and their environment more naturally (which has been found true with normal children.)

Willy was a child who started the year by being very careless with everything. In the beginning, he did not handle the things in his environment with care, but by the end of the year he was the best at handling things in the school environment. He stayed after school every night to see that the rest of the children had done their clean-up activities correctly. He told the teacher how well the children had done. The other children also became neater in appearance and in keeping the room neat.

The Montessori sensorial training materials had to be modified very little, but the method in which they were presented had to be modified. Some materials were added because the teacher did not have enough Montessori equipment. The other modification was the use of greater teacher control over the children's activities.

Mike and Dewayne were two cerebral palsy boys who seemed to have gained from this modification. Dewayne learned to use a crippled arm that he had never used before. He learned this by working with the bottles and lids. The bottle activity forced him to use both hands. Mike had been in this class for three years. By the third year, the teacher had completed most of her modifications. The change affecting Mike most was teacher insistence in the use of the materials he needed. Mike worked hard on the tracing box, and the metal insets. By the end of the third year, he could copy print from the board onto regular ruled paper.

The Montessori reading program with its i.t.a. modifications seemed to have a good effect on these children. All but three of the children learned to read. Prescribing individual reading activities seemed to make the difference with these youngsters. The previous year the teacher had used only the i.t.a. reading program. The year before that, only the Montessori reading program was used. It seemed that by combining the two approaches, the children became much more

enthusiastic. The teacher gave each child his own set of sound symbols, and this seemed to have made reading more personal to the children.

Kathy, a mentally retarded child was one of the children who gained in reading. In April, 1967, she was tested on her reading ability. Her score was zero. In April, 1968, she was tested with the same test, and her score was grade level 2.2. Kathy was able to return to a regular school part-time the next year. A modified Montessori approach and i.t.a. were used with Kathy in reading.

When one looked at this group as a whole, a noticeable change was that the children worked peacefully on their own. This was not the case before the teacher made the modifications. Before the program was structured, the children seemed to run aimlessly about, disturbing one another.

Robin was a typical classroom disruption. She began the year by throwing the materials in every direction. The teacher finally had to isolate her from the group. Montessori felt that a child should not be isolated from the group. However, the teacher had no other choice with Robin. Robin finally became tired of being isolated. By the end of the year, she was capable of working with the materials without causing any disturbance.

Cathy was much the same type of child as Robin. She had been in this group for three years. This girl had never learned to work with

the shelf materials without disturbing others. However, Cathy took a great deal of interest in reading. The teacher found that she had to keep her supplied with plenty of interesting reading materials. If this was done, Cathy caused few problems. Modification of the Montessori reading program and i.t.a. were used with Cathy.

Only a few of the pupils were mentioned, because not all the children showed specific gain or specific failure. In summary, it is felt that structuring the Montessori method was the most significant aspect seen in all the modifications to help these handicapped children.

## II. CONCLUSIONS

The Montessori method with certain modifications did work for this teacher. However, the modifications came about through much trial and error. Though it seemed that the modifications made were successful, they might not be as successful for another teacher.

The investigator found that the children did not learn as naturally as Montessori suggested. The lack of natural learning may have been due to the children's handicaps. However, it may have been because most of the children had already passed through what Montessori called the sensitive periods. Standing gives this example:

. . . suppose that a child of three and a half, or four years, wishes to transport a series of objects--say the ten Montessori number rods--from the cupboard to a rug on the floor on the

opposite side of the room. Quite likely the child will make ten separate journeys, . . . . A child of that age quite commonly makes one separate journey just to carry the smallest rod, which is only four inches long. No adult would ever act in that way, nor, for that matter, would a boy of seven years or more. They would carry as many rods together as convenient in order to save time and energy (18:16).

With this in mind, one could see that much of the learning had to be through prescribed activities.

The investigator felt it was important that the children learn individually, at their own speed, and on their own initiative. This made the program valuable to her and to the children.

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## APPENDICES

## APPENDIX A

Washing Table

1. The mother pours the water into the basin, about half-filling it. In so doing, she is careful to stop just at the moment of pouring, after having tipped the pitcher, in order to better control the flow of water.
2. She sets the pitcher down in the place from which she took it.
3. She places her hands in the water, together, with palms down, and then turns them over. She does this twice to insure getting the hands thoroughly wet.
4. She takes the bar of soap from the dish in her dominant hand.
5. With the soap in her hand, she "shakes hands" with the soap, rubbing her palms together with the soap in between.
6. She replaces the soap in the soap dish.
7. She lathers her hands back and front with the soap on her hands.
8. She takes the nail brush from its dish, and starting with the four fingers of the opposite hand she draws the brush across the nails, and then the thumb.
9. She switches the brush to the other hand and does the same with the opposing hand.
10. She rinses the nail brush.
11. She replaces it in its dish.
12. She rinses her hands by repeating twice the gesture for wetting them, making sure the soap is off.
13. She takes a towel and wipes her hands. First one hand and then the other.
14. She replaces the towel.

15. She pulls the pail out from under the table.
16. She pours the soapy water into it.
17. With the wash cloth, she wipes out the bowl and replaces it (15:106-107).

## APPENDIX B

Silence Game

" . . . Darken the windows, and tell the children to close their eyes, resting their heads upon their hands. They assume this position, and in the darkness the absolute silence returns."

"'Now listen,' we say. 'A soft voice is going to call your name.' Then going to a room behind the children, and standing within the open door, I call in a low voice, lingering over the syllables as if I were calling from across the mountains. . . . Each one as he is called, lifts his head, opens his eyes as if altogether happy, then rises, silently seeking not to move the chair, and walks on the tips of his toes, so quietly that he is scarcely heard. . . ."

"Having reached the door, with a joyous face, he leaps into the room, choking back soft outbursts of laughter. . . . The one who is called feels that he is privileged, that he has received a gift, a prize. And yet they know that all will be called, 'beginning with the most silent one in all the room.'" (11:210-211)

## APPENDIX C

List of Didactic Material for the Education of the Senses

- (a) Three sets of solid insets.
- (b) Three sets of solids in graduated sizes, comprising:
  - (1) Pink cubes
  - (2) Brown prisms
  - (3) Rods: (a) colored green; (b) colored alternately red and blue
- (c) Various geometric solids (prism, pyramid, sphere, cylinder, cone, etc.)
- (d) Rectangular tablets with rough and smooth surfaces.
- (e) A collection of various stuffs. (to feel)
- (f) Small wooden tablets of different weights.
- (g) Two boxes, each containing sixty-four colored tablets.
- (h) A chest of drawers containing plane insets.
- (i) Three series of cards on which are pasted geometrical forms in paper.
- (k) A collection of cylindrical closed boxes (sounds).
- (l) A double series of musical bells, wooden boards on which are painted the lines used in music, small wooden discs for the notes (5:18-19).

## APPENDIX D

## THE THREE PERIOD LESSON

This is the technique used in presenting materials. The example used here is the sounding of the sandpaper letters.

Take two contrasting sounds, such as "m" and "a," from the letter box. Take the "m" and "a" and put them on the table in front of the child. Tell him you are going to teach him their sounds.

First Period:

Pick the "m" up and trace it with the index and middle fingers saying "This is (sound)." Repeat until you are sure the learner understands. Give the letter to the child. He will copy the example shown him. Then go through the same procedure with the "a."

Second Period:

Mix the letters. Then ask him: "Give me 'm.' Give me 'a.' Mix them again, sometimes asking for the same sound in succession.

Third Period:

Now see if the child can remember the sounds for himself. Pick up "a" card and say: "Which is this one?" If he does not say it correctly, help him to do so. Do not proceed to the third period until he can do the second one well. If he makes mistakes, return to the second period.

Sometimes three or more sounds can be taught at the same time, in the same way. On the following day, repeat the lesson adding another sound. Always take the sounds already learned, until all the sounds are known (11:109).