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DISSERTATION

Presented in Partial Fulfillment of the Requirements for
The Degree Doctor of Philosophy in the Graduate
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By

JEAN GRUTZMACHER, A.B., M.A.

The Ohio State University
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CHAPTER I

INTRODUCTION

Throughout the centuries man has learned to swim and has developed his swimming proficiency by observing and experimenting. The history of swimming shows its value for war-like pursuits and survival in previous centuries, and in modern times swimming has been useful for recreational purposes. It has been shown that new strokes frequently have been added and that old methods of swimming often have been modified. Man, by recording his aquatic accomplishments, has become highly effective as a swimmer.

All persons can and should learn to swim. The skills acquired in swimming have a value to the individual's physical, psychological and social well-being.

Swimming is unique in that it does not require any special equipment or preparatory motor skill coordination. It differs from other sport activities in that swimming skills do not require coordination or learnings solely dependent upon visual acuity. The learning of swimming requires practice in the natural media to assist the
individual in overcoming the obstacles of body balance and weight, buoyancy, and general skills of propulsion.

The nature of swimming makes it particularly adaptable and appropriate for all children, and yet it is astounding to find only a small proportion of the 10,000 blind children of school age in the United States\(^1\) learning the basic water skills to insure safety, physical development, and carry-over recreational pursuits.

The learning of swimming has developed and grown within communities but the opportunities for swimming for the blind lie still within the rudimentary stages. Why? There seems to be an absence of qualified personnel to teach the blind child. Swimming facilities in the state schools for the blind are limited. Buell's *Sports for the Blind*\(^2\) showed that a number of state schools for the blind were offering wrestling, games, track and field and dance. Few schools at the time of his report offered swimming for children six to ten years of age. Communities do not think of swimming for the handicapped. Often there is a question

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raised, "Oh, can they learn to swim?" "How, and who, will teach the visually handicapped, the deaf, the crippled?"

Until recently, schools for the blind have not shown much concern for the child's physical education. The educational trend was to educate the child for an economically useful, independent existence in society. Parents of blind children have had a tendency to over-protect the child and further isolate him from his sighted peers. The adult's fear of failure and/or injury often has restricted the blind child's participation in activity. Finally, little has been written of the methods, procedures and problems in teaching swimming to visually handicapped children.

**The Purpose and Scope of the Study**

This study sought to determine the significance of three methods of teaching basic swimming skills to the visually handicapped child. The study had two facets: Primarily, it attempted to evaluate method and procedure by means of experimentation and subjective evaluation. Secondly, it endeavored to reveal to the public, as well as parental and administrative groups, successful techniques for teaching swimming to blind and partially seeing children.
The methods used in the experimental unit included (1) instruction, Plan A; (2) mind pictures and games, Plan B; and (3) artificial aids, supports, and music, Plan C. Each plan had the Red Cross method as the standard base. The instructional method included only the basic essentials and techniques as listed in the Red Cross Instructor's Manual. In Plan A all games and water activities were eliminated. The second method, the mind pictures and games, included the basic Red Cross method with games and phrases adapted to children of the second and third grade age range. The third method, the artificial aids, included the use of swimming fins, life jackets, rubber tubes and any other artificial means of flotation. With Plan C music also was introduced to the teaching unit.

The children comprising the experimental group were the children of the second and third grades of the Ohio State School for the Blind. These children, full-time students at the school, fulfilled the physical requirements and parental authorization for participation prior to enrollment in the experimental program. A total of forty-four children; twenty-six girls and eighteen boys comprised the experimental unit. Of this number twenty-five were totally blind and nineteen were partially seeing. All children were initially non-swimmers.
Within the framework of the experimental program and its fourteen instructional periods, the children received individual swimming lessons under the direction of American Red Cross certified teaching personnel. The criteria of the students' accomplishments were the number of skills passed by each child at the conclusion of the experimental program.

Included within this text are the results of the experimental program with a limited number of children from one school for the blind; the observed adaptations of strokes; the general faults observed in swimming performance; and admonitions necessary for teaching.

Background of the Problem

Lowenfeld stated that "blindness restricts the individual in three basic ways: in his range and variety of experiences, in his ability to get about, and in his control of the environment and of himself in relation to the environment." It is, therefore, essential to consider some of the major characteristics and problems of the visually handicapped child.

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Physical Characteristics of the Blind

The blind child needs activity just as the seeing child does because activity is essential to sound growth and development. In general it has been shown that many blind children are inactive, they do not move about freely; they are limited in opportunity for participation because of the restriction of visual acuity or parental pressures; or they are over-active in the attempt to keep pace with the sighted children. The more common pattern seems to fall to inactivity.

Blind children, probably because of a lack of opportunity to be active develop some characteristics unique to the blind child. In addition to a retarded growth and maturation, the blind child may lack physical vitality, have less strength, endurance and agility than the normal seeing child of the same age and may exhibit poor posture resulting from poor muscle tone and development.

Psychological Characteristics

It has been noted that the blind differ from each other even more than do seeing persons. Besides ordinary personality differences, they are handicapped by varying degrees of blindness and have become blind at different ages.

References on the adjustment of the blind do not show any definite and conclusive differences or psychological traits characteristic of all blind persons. In substantiating this point Hunt said, "There is no obvious emotional problem or peculiar psychology of the blind or partially seeing person, yet, as with any person who has restrictions, certain personality characteristics of a blind person may be accentuated." The blind are more likely than sighted persons to be under nervous tension and to harbor feelings of insecurity and frustration, which may produce a state of anxiety that interferes with their normal health. For many blind persons their physical attributes and psychological tensions are shown in their physical-social inadequacy to the total environment. Many blind children tend to daydream, avoid games and social groups, and display mannerisms better known as "blindisms." Blindisms have several characteristics: the children may rock the body back and forth, twirl rapidly round and round, wave their hands in front of their faces, bend the head forward, or may rub their eyes. The cause of


these mannerisms is not known definitely, but the most widely accepted theory is that they occur and the child assumes this role as a substitute for normal physical activity which has been thwarted by blindness.\(^7\)

According to Buell "...adjustment to blindness depends primarily upon the individual's innate make-up and the effect of the environment upon his personality."\(^8\) To obtain an adjustment to his environment the blind child needs to gain insight into his resources and develop a willingness to use them. The adjustment, moreover, may be the basis for a feeling of security, self-confidence and a sense of belongingness.

The attitudes of parents, teachers, playmates and the community influence the adjustment of the child as much as the attitude of the child about himself and often keeps him from participating in activities. The child develops a concept of his role and personal worth in society. This concept is essential to the individual's psychological well-being and social interaction with physically "normal" people.

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An accomplishment in a physical activity has value in that it aids the blind child in his social relations in the community.

**Social Characteristics**

Since the social order in which man lives determines his role in society, life for the handicapped person may become more difficult than it need be. It has been shown that the blind individual must strive to adjust to the environment for "...blindness or any other significant deviation is likely to result in a limitation of free interaction between the handicapped individual and other persons in his social environment." With the belief that there is no distinct personality type produced by blindness, Frampton suggests that maladjustments are due to the restrictions of the individual character to the social situation in which he finds himself.

Social adjustment is important to the handicapped person, for he must learn to be a good member of the society in which he lives; he must learn to make acceptable

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adjustments to social prejudices, and he must learn to alter his life in a way which will satisfy both his own wants and the needs and the wishes of those who surround him. He must, in other words, achieve a balance between his own wishes and those of his social environment by learning to make social contacts while he strives to prove his true worth to those about him.

A blind child must be made to feel he is a part of a group, not a blind group but of a sighted peer group. The child's feelings of separation from the group must be overcome and his educational and recreational experiences should provide a means for individual adjustment as well as physical and social opportunities. He needs the opportunities because the handicap may cause him to withdraw from social experiences; opportunity should enable him to alleviate his fears and his anxieties and remove several of the physical and social barriers.

Skills gained in sports have a threefold purpose; to enable the learner to widen his social contacts, to find activities for leisure time with his peers, and to acquire skill for future years. Many sports are appropriate for the blind child, those which require little adaptation or additional equipment. Lowenfeld suggests calisthenics,
gymnastics, tumbling, wrestling, skating, bowling, folk
dancing, track and field sports and swimming as some of the
activities which blind children can enjoy without any or
only slight adaptations. Buell adds games and relays,
marching and a modified game of softball to this listing, and Potts adds card games, bowling, and hiking.

The main value underlying the program for the handi-
capped should be the opportunity to participate with his own
group as well as with the sighted peers of his social en-
vironment. If the blind child is to play successfully with
the seeing child, Buell believes he must have well-developed
skills in order to feel secure enough to take the
initiative.

The Value of Swimming

Swimming makes its contributions to the physical,
the psychological and the social needs of the individual.

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11 Berthold Lowenfeld, Our Blind Children, p. 155.
12 Charles E. Buell, Recreation for the Blind (New
13 P. C. Potts, op. cit., p. 177.
14 Charles E. Buell, Sports for the Blind (Michigan:
It is an activity requiring little or no adaptation and it has a distinctive carry-over value. A blind child need not be excluded or held apart from his sighted peers in this activity.

Throughout the body of this text, the writer attempted to clarify the role of swimming and aquatic safety to the blind and partially seeing child, and, by means of a descriptive outline to note methods of value and terms pertinent to the teaching of swimming. In addition to the study the writer also endeavored to develop the objectives and setting of the experimental design as a guide to subsequent programs.

The major emphasis of this study, then, was to present an evaluation of the experimental unit, the methods employed and the subjective outcomes so that the reader might determine for himself the appropriate method or methods to be utilized in teaching other visually handicapped children the horizons of aquatic skill, safety and satisfaction.
 CHAPTER II

RESUME OF THE HISTORY OF THE PROBLEM

In order to gain a greater understanding of the needs of the visually handicapped child it seemed necessary to investigate the literature to determine the significant facts pertinent to the study of the problem. Three phases of the literature were predominate: the education of the visually handicapped - the aims, objectives and programs of the residential schools; the physical education program - its purpose and objectives; and the value of swimming for its physical, psychological and social development of blind and partially seeing children.

Throughout history it has been observed that the child's total adjustment to life depends to a large extent upon the kinds of educational opportunity afforded him. Within our present democratic system of education, the need and the worth of the individual has been made more evident and the basic belief within the educational framework shows that "all children should have the kind of education from
which they can profit most."15 This means that there must be an opportunity for all to participate - the physically handicapped as well as the physically normal. Thus, "...the goals of education for children with impaired vision are basically the same as those for all other children."16

Education of the Visually Handicapped

It is of interest to note the historical influence in the educational training of the visually handicapped.

Hauys theory for the education of the blind had two aims: one directed toward educating the blind by methods as similar as possible to those used with the seeing; the other to make the blind and partially seeing as self-supporting as possible.

Throughout the educational growth of methods for the blind there seemed to evolve an influx of the industrial or manual training courses. These plus an emphasis on religious instruction were the major objectives in many of the early English institutions for the blind. In America,

16 American Public Health Association, op. cit., p. 56.
however, the religious motive received less emphasis, but the vocational aim remained predominant, most likely because of the poor economic condition of the blind.

Present-day objectives for the education of the blind are based on ultimate self-support, independence and social efficiency. Basically, the objectives of elementary education for blind children, as they are for all children, are ones of general education, preparation for vocational training and/or training for higher education.

The realization that much of the manual training and formal sense training were previously overemphasized and that the formal methods of teaching traditional subjects did not give consideration to individual differences brought change. However, many of the social aims of education for the blind remained neglected along with many aims and objectives of the physical education program.

For the blind there grew an awareness of the importance of social aspects as well as the importance of formal subject matter; subsequently a greater emphasis was placed upon individual differences and pupil activity. The program of education expanded in order to allow it to parallel, as closely as possible, life situations within the individual: the basic needs of love, a sense of belongingness
and personal worth, the acceptance of the rights of others, the development of initiative, imagination and an understanding of the elements of cooperative living.

According to Branson, "...blind and partially sighted children learn most by doing just as normal children do."\(^1^7\) Because of the basic element of learning it is essential that any visual differences, limitations and assets be considered for each child and that adaptations in methods be based upon sound education and psychological principles in regard to what is known about blindness.

The American Public Health Association booklet supported this when it stated:

The differences between blind and partially seeing children are great. The educationally blind child depends largely upon the sense of touch and hearing for his education and for obtaining information about his physical and social environments. On the other hand, the partially seeing child should be encouraged and helped to use the vision he has. He should be educated chiefly through the sense of sight as are his normally seeing contemporaries, with appropriate support from audio and other educational aids.\(^1^8\)

In developing a guide to the education for the visually handicapped Lowenfeld indicated that the education


of the blind must stress concrete experiences and the observation of objects and situations in their totality. He further stated that education must aim at giving the blind children a knowledge of the realities around them through the application of special methods in teaching; the confidence to cope with these realities, and, the emotional factors; the feeling that they are recognized and accepted as individuals in their own right, their sociability and the readiness and willingness of their environment to accept them.

The community as well as the school has an essential part to play for the total development of the child. Oberteuffer defined this role when he noted "The responsibility belongs to the administration and the teacher to find and teach activities suitable to each child and to construct a program flexible enough to allow for adaptations to individual needs and limitations."
Inherent within the above statement and within others is the prime factor of the importance of the individual whose development in the instructional, the community or the environmental unit must be considered before adaptations and changes are made. Thus, the statement that "parents and teachers must keep in mind that the blind child is first of all a child and that his intellect, his emotions, his desires are fundamentally like those of other children"\textsuperscript{22} has merit.

Physical Education - Paralleling the Sincere Interest of the Educational Program for the Blind

The physical education experiences for visually handicapped children should approximate those of the average seeing child considering like ages, interests and goals. Oberteuffer supported the need for physical education opportunities for the blind and partially seeing child when he stated, "...the exceptional student is entitled to his physical education. It is a great mistake to believe that modern physical education is only for the strong, and the athletic."\textsuperscript{23}


\textsuperscript{23} Delbert Oberteuffer, \textit{loc. cit.}
The values of physical education for the blind lie in the contributions they may make to physical, psychological and social development. Daniels noted that through programs of physical education persons with visual disabilities "...receive an opportunity for needed vigorous activity; develop skills and general coordination; develop self-reliance and a measure of independence; and tend to make satisfying group associations." 24 "Physical education and recreation," according to Lowenfeld, "are essential parts of a good school program." 25

Swimming

The blind child needs to have the opportunity to participate in recreational activities of his school and/or community. As Branson says, he should be encouraged to participate in sports and every experience from which he is capable of learning without endangering himself or others. 26

Recreational experiences, then, should be planned to meet the needs of the individual. According to Cutsforth,

26 Ralph Branson and Helen K. Branson, *op. cit.* , p. 84.
"the value of any recreational activity should be judged in terms of the bearing it has on the objective of personality and social adjustment, and the direction it gives to social growth."27

The value of swimming lies in its physical, psychological and social attributes in addition to the demands placed upon it for personal safety and recreational pursuits.

The values of swimming for the blind are not of recent origin. Gillogly defended the need for the program in 1933 when she said,

Swimming provides the blind with a pastime and a form of physical recreation which they can enjoy on an equal basis with the sighted.... Swimming gives health and tone to the vital organs. Swimming also develops confidence, independence, coordination and rhythm.28

She further added that "...in swimming the blind are able to discuss the sport intelligently, and compete with their sighted friends."29 In regard to carry-over value she noted,


29 Ibid.
"A child who learns in his early years, is afforded a life-long pleasure and healthful sport."\(^{30}\)

In 1936 Degnan stated:

In swimming blindness is not so large a handicap as in most of physical education. The danger of injury through contact in the water is slight. Consequently the blind person may swim with comparatively little restraint. ...Swimming, besides having a protective value, provides an excellent physical exercise. Almost every portion of the body is employed in the act of swimming, as a stimulus to body development swimming is outstanding among physical exercises.\(^{31}\)

He placed the most important value of swimming for the blind on the recreative interest.

Speaking before the American Association of Instructors for the Blind, Wilkinson noted three values of the swimming program:

1. It is the one activity that can be entered into without the feeling of restraint which is common with blind boys and girls.
2. It need not be modified or changed (to any extensive degree) for the students.
3. It comes nearest to using all the muscles of the body than does any other activity.\(^{32}\)

\(^{30}\) Ibid.


More recently educators and teachers of the blind have been concerned not only with the physical but the social aspects of this sport activity. Buell, a teacher of the blind, reiterated the physical-social value supporting this thesis when he stated, "Swimming is not only one of the best all-around exercises but is a social asset....A blind adult fits well into a swimming party, but he often feels out of place in other activities." Thus, the extrinsic values of safety, pleasure and carry-over cannot be underrated for this sport's contribution to the visually handicapped.

Despite the early references of Gillogly, Degnan and the more recent articles of Buell on the swimming programs for the blind, the writer found the literature limited and somewhat incomplete because methods were not stressed. Thus, the reader was told who the blind were and why, but very little was written concerning their aquatic experiences or the methods used in teaching them to swim. Belenky's publication, *A Swimming Program for Blind Children*, described the swimming program established for a camp setting.

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References to his program are included in subsequent chapters.

The foregoing chapter historically attempts to show some of the values of the swimming in ramifications toward the optimum functioning of the individual as a physically, mentally and socially adjusted being.

At the risk of enforcing repetitiousness upon the reader, the following statement is cited in evidence of the many worths of the swimming activity while, at the same time, it endeavors to proffer to the reader a greater understanding of the nature of the visually handicapped in the water, arouse in him an awareness of the problems of teaching and adapting skills, and hence, lead him to appraise the results of teaching procedures and methods.

Swimming provides particularly valuable recreation for the visually handicapped. Those who move falteringly on land, who fear to move freely in space, often experience profound freedom when they are in the water. The exciting stimulation of the water heightens their pleasure in moving and often brings an animation seldom observed among the blind.  

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Valerie V. Hunt, *op. cit.*, p. 95.
CHAPTER III

DEFINITIONS, GROUPING AND OBJECTIVES

A. Definitions

In order to understand the significance of groupings and the objectives of the experimental program it became essential to clarify terms often quoted and misused, and to define the setting of the experimental grouping.

1. Blind

As Barker expressed it:

The definition of blindness has been a persistent problem for all disciplines concerned with the blind. Blindness is not a scientific term; its meaning varies from country to country, from state to state, and from investigator to investigator.....36

The term blind is often misleading since the loss of vision ranges all the way from a slight loss to a total loss with no definite sharp dividing line between the blind and the sighted.37

37 Rudolph Pintner, op. cit., p. 207.
The United States Census described the blind as: "Those individuals whose vision is of no practical value for the purpose of education, business or living."  

Blind children, then, are those who despite medical care and the best corrective measures, have such limited vision that they cannot use sight as their chief channel of learning. The legal definition of blindness is a visual acuity of 20/200 or less in the better eye after correction or a visual field restricted to less than 20 degrees in the widest diameter.

Children listed as blind in the experimental program were those who were totally blind; those who were unable to perceive form, movement or light.

2. Partially Seeing

Partially seeing children are those who after all medical assistance and correction are unable to profit from many of the educational opportunities of their sighted peers. "For classification purposes, these children have a visual acuity of 20/70 or less in the better eye after the best correction possible and yet they have sufficient residual sight so that they may use it as their chief channel of learning."  

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38 Valerie V. Hunt, op. cit., p. 75.
40 Ibid., p. 13.
Children within the experimental program constituted those included in the above definition: those who had light and object perception and those who were able to distinguish objects at a distance of three feet or less.

3. **Handicapped**

The term "handicapped" through common usage came to refer to the actual disability. At present the meaning of the word has been modified and is used to describe persons with physical, psychological and social degrees of difference and those who restrict their contacts with "normal" people.

The term handicapped, according to Hunt, "...is too loosely used even today."\(^1\) She noted, "Strictly speaking, a person is not a handicapped person, for to describe a person thus is to imply that he is inferior in all respects. Actually, he is a person with a disability that may act as a handicap in his particular culture, at a particular time, and in a particular circumstance."\(^2\) However, it must be remembered, as Buell so aptly stated, "A handicapped person is a human being with individual capacities."\(^3\)

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\(^1\) Valerie V. Hunt, *op. cit.*, p. 48.
\(^2\) Ibid.
The term handicap does not convey the same connotation for all "handicapped" groups, persons or cultures; nor does it imply the same thing for all blind or partially seeing children. It has been shown that "the degree to which a person is handicapped by his blindness is determined partly by how much of his sight he has lost and partly by the time at which he became blind." 44

4. Adapted

The term is appropriate when it implies that a program or skill has been altered in accordance with the individuals' capacities, limitations and physical-social needs.

In regard to the over-all term Stafford remarked, "Sports adapted to one's capacity satisfy generously the need for satisfactory social activity, and they have the additional advantage of being full of fun." 45

Swimming needs little or no adaptation for the blind. Within the experimental program the only significant adaptation employed was in the individual method or sequence of teaching and subsequent adaptations of head position due to body build, extent of fear or general kinesthetic

44 Valerie V. Hunt, op. cit., p. 75.
comprehensions. In most instances adaptation was the exception rather than the rule.

5. **Non-swimmer**

The term was used to group the children within the experimental unit. As employed the classification included (1) children who had never been in the water; (2) children who showed no evidence of swimming skill, basic movement in the water or the ability to float; (3) "fear cases" thus, no swimming ability; (4) children who were not able to swim a minimum of 10 feet and who had not received previous swimming instruction. Non-swimmers were selected because it was believed that the learning task would be more difficult if previous habits had to be obliterated before the acquisition of correct techniques began.

6. **Individual Instruction**

The term individual instruction most generally implied one student per teacher.

In 1934 Gillogly noted:

Sighted children learn to swim by imitating the movements of their instructor, but the blind child must be taught individually.  

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47 Edith Gillogly, *op. cit.*, p. 49.
In searching the references the writer found considerable discrepancy in the use of the term "individual." Because of the practicality of staffing the program and meeting requirements for adequate instruction and safety, the writer accepted the following definition as a reference for planning and staffing the instructional-experimental unit:

"Individual teaching, a term which may rightfully be applied to a single pupil, to a pair, or to as many as four, is to be sure most productive of individual result, since it is most intensive."48 Within the experimental unit, "individual instruction" consisted of a small grouping of three students per instructor who gave an equal time to each child individually and who often utilized the small grouping for lessons and inter-motivational measures supplementing the instructional program.

B. Groupings

1. Visual Acuity

Children in the experimental program were classified according to their visual acuity: totally blind or partially seeing. (See Section A, Chapter III.)

Mixed grouping refers to the arrangement of the children in the teaching groups: (1) blind, (2) partially seeing, (3) blind and partially seeing.

2. Sex

Both boys and girls comprised the experimental group. Eighteen boys and twenty-six girls were placed in the three instructional groups.

3. Age

Numerous authorities have held that swimming instruction should begin early. Torney summarized the data when he noted,

Conditions and precedent will determine at what age the child begins to receive swimming instruction. The American National Red Cross recommends the junior high school age, and the Committee on Curriculum Research of the College Physical Education Association concurs in this opinion. These organizations admit that the junior high school constitutes a postponement of the starting age for swimming instruction, but deem such delay necessary because most communities do not have sufficient facilities for the earlier school grades....In short, swimming skills should be taught in the elementary school if facilities are available. This tenet is supported by those communities and organizations which sponsor 'learn-to-swim' campaigns stressing instruction for pupils of elementary school and kindergarten age.49

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49John A. Torney, op. cit., p. 16.
If one were to examine the recommendations of Gessell, Jenkins et al., the report of the White House Conference on Child Health and Protection and the report of the National Society for the Study of Education one would find swimming one of the skills recommended for early childhood. Children do not seem to have as much fear of the water as adults or even teen-agers. Swimming, which the writer assumes to mean general "water play," has been listed for the child of five or six years of age. For the seven-year-old or eight-year-old it is noted as a time "...just right for swimming." In addition, "Starting the child in swimming at an early age is justified by two sound reasons: First, the pupil will be less likely to have acquired conditioned fears of the water which obstructs rapid learning; second, many lives will be saved." Torney noted that drowning accounts for approximately 7 per cent of the total accidental deaths in the United States every year....and that two out of every three Americans cannot swim. Data

50 Delbert Oberteuffer, op. cit., pp. 254-256.
51 Ibid., p. 255.
52 John A. Torney, loc. cit.
53 John A. Torney, op. cit., p. 7.
compiled by the National Safety Council in 1958 showed that more drownings occurred within the age groupings of 5 to 19 than within any other age range; and that the loss of life within this group was greater than for the second highest, which was the 15 to 24 year range. Providing swimming instruction before the junior high-school level might help prevent much of the needless loss of life from water mishaps; and decrease many accidental drownings in boating and pleasure swimming.

The age group sought for the experimental program was the range within the second and third grades (approximately seven to nine years of age). Because of the educational lag of children in schools for the blind, the ages of the experimental group ranged from 6.7 years to 12.1 years. The age ratio was as follows:

- 6 years old = 2 children
- 7 years old = 9 children
- 8 years old = 15 children
- 9 years old = 11 children
- 10 years old = 6 children
- 12 years old = 1 child

Lowenfeld explained the reason for the educational lag for blind children when he cited the findings of a study showing an over-age of 2.5 years in students of the third

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54Sheeny Uncles, Personal Conference, American Red Cross, Franklin County, Columbus, Ohio, December, 1959.
and fourth grades. The various factors responsible for the age-grade retardation were (1) environmental influences resulting in lack of opportunity for observations, (2) slower acquisition of knowledge due to lack of sight, and (3) slower Braille reading. 55

It is not uncommon to find blind children slightly older than their sighted peers for their grade placement. However it must be noted that not all blind or partially seeing children are retarded in grade-age placement.

4. **Swimming Ability-Experience**

The testing program consisted of non-swimmers. The grouping included children who never had been in the water; children who showed no evidence of swimming skill, basic movement or flotation; "fear cases," children who exhibited a fear of water; and children who had not had previous swimming instruction. Swimming ability was assessed by parents and the writer through check list survey, interview and observation.

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5. **Physical Condition**

Each child in the program received permission of the family physician as well as the school physician. Children with restrictions of jumping, diving, placing head under water or multiple handicaps were eliminated from the experimental group.

6. **Psychological Condition**

Children with brain damage or extensive psychological problems or deviations were excluded from the testing program.

C. The Program

1. **Presentation of Material**

The experimental swimming program was planned on an individual-group basis. Lessons were conducted in an informal manner with the basis of all approaches, the American Red Cross outline. Three methods were developed: (1) pure instruction, Plan A; (2) mind pictures and games, Plan B; and (3) artificial aids and music, Plan C. Additional information of each method may be found in Chapter IV.

2. **Size of Groups**

As was shown in Section A, most authorities recommended individual instruction for the teaching of swimming.
For general class instruction groups, a grouping of 10 to 16 children is not uncommon while an average instructional group should be approximately 6 to 8 pupils at the elementary level.

In the recent Aquatic Survey of Swimming Facilities for Blind in the state schools, the writer found the ratio of students per teacher quite alarming. Only 3 per cent of the schools taught swimming with the ratio of two students per instructor; 14 per cent enrolled four students per instructor, while 21 per cent and 55 per cent, respectively, had five students or more than five students to one instructor.

It was felt by the writer that a small group, no more than three children per instructor and no more than fourteen children in the pool during the instructional period, would constitute an adequate instructional-safety program and provide for more individual instruction. In addition, the writer planned the small groupings to facilitate the learning process and provide the child with the opportunity to progress at his own rate and not the rate of

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the members of his group. In the experimental plan the ratio of three students per instructor was strictly adhered to. In addition, two life guards supervised the teaching area; two persons supervised half the group in games and rhythms in the gymnasium; and one student assisted with dressing and locker room duty.

To keep the swimming instructional program on an individual basis and to divide the children into two groups for the instructional swimming program, one group was called "fish" and the other group called "whale." The "title" grouping facilitated re-grouping and eliminated a double check of names for group I or II. The pride of group association to the "whale" or "fish" and the interest generated by this grouping were remarkable.

In short, it might be wise for the teacher to remember that little names and "group titles" often develop additional motivation and establish a sense of organization or placement with the child, especially the blind child.

The class teaching groupings were as follows:

6:00 - 6:40 Whales swim; Fish supervised play
6:45 - 7:20 Fish swim; Whales supervised play
Supervised play did not include drill on strokes or swimming skills. Support of this plan was noted by Torney when he said,

Experiments have shown that learning is retarded if the physical activity participated in between periods of practice is similar, but not identical, to the swimming skills that is in the process of being mastered. Confusion results because the learner must discriminate between those movements which have application in swimming and those which do not.57

3. **Number of Lessons - Length of Lessons**

The number of lessons for the instructional swimming program was based upon the following: (1) the handicapped program of the Summit County (Akron) Red Cross swimming program,58 a one-hour session once a week for twelve weeks; (2) Todd's report,59 a one-half hour session once a week for twelve weeks; (3) a recent aquatic survey of swimming opportunities for blind in State Schools for the Blind by Grutzmacher.60 This study showed that 51 per cent of the schools had swimming once a week, and 41 per cent of the

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58 Akron Chapter - American Red Cross, notes on Swimming for the Blind, 1958.
60 Jean Grutzmacher, *op. cit.*
schools offered swimming twice a week. No references was made to time allotment; (4) Observation of the general program in a two-week camp: daily lessons, approximately 40 minutes in length; (5) Personal letter from Charles E. Buell, teacher, California State School for the Blind. His classes include a 40-minute swim period each week for boys and girls.  

Scott, in a study of the learning rate of beginning swimmers, stated that a majority of swimmers can be taught sufficient swimming skills to pass a 15-minute test in eight weeks; that is, fifteen-sixteen lessons. Although reference to this study was made with college women, the writer believes the time was sufficient for the children of the experimental program.  

The writer established the aquatic program for blind and partially seeing at fourteen lessons of forty minutes. It was hoped the fourteen lessons would be the equivalent of a normal two-week camp program or would approximate a vacation period of the average family. From conferences and readings it was felt the program of two

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lessons a week would be of value to the children. The lesson days were Monday and Wednesday evenings. Any other daily schedule interrupted the Blind School program and any day later than Thursday was not feasible because of the number of children going home for the week end. The lessons covered a seven-week period, with an additional day for a "splash party."

In defense of the seemingly long plan for teaching swimming, it has been shown that "...young children usually enjoy the learning process sufficiently that they are not disturbed by the time spent in relation to swimming competence." In addition it has been shown that "a greater number of practice periods of lesser length will be more productive than will fewer periods of greater length." Lessons conducted under this plan are beneficial for the beginner who fatigues easily as a result of his inefficient movement.

The administration of the school for the blind approved the seven-week period, for the program neither disrupted the total school program nor fatigued the youngsters after an active school day.

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63 Ibid., p. 91.
64 John A. Torney, op. cit., p. 68.
4. Personnel

Certified water safety instructors and water safety aides comprised the personnel of the experimental program. The student-teachers were selected for their ability to work with children, their past experience with the visually handicapped, and their general interest, capability and explicitness in teaching swimming.

Personnel with various teaching experiences and skills were selected to approximate the teaching personnel of other schools, camps and community groups.

The following criteria of teachers for the blind was considered in teacher selection and placement:

A teacher of the visually handicapped should be patient, resourceful, have a likeable personality and a pleasing voice; be sincere, show integrity, determination, a sense of justice, energy and a force of character.65

D. The Physical Setting

1. Pool

The swimming pool area was examined by the teaching personnel for its relevance to satisfactory teaching and

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safety procedures. Additional safety measures of precautions were applied to the pool area. Ropes were extended across the width of the pool to the swimming areas. Other precautions might include a guide rope, a rough surface at the pool edge or an auditory signal.

In the experimental setting the writer found it of value to place kick boards along the edge of the pool. (See Figure 2, page 42.) The boards were placed approximately six inches from the edge of the pool deck. A child used the board as a measure of distance, in that he could feel the board and know when he was "near the edge," take one step and a sit and be ready for the lesson and the teacher. In a community pool a non-slip surface or a slightly raised deck would suffice this measure.

The orientation to the physical plant is of great importance to the blind child. He must know the placement of the lockers, the proximity to the swimming pool, the outer layout of the pool, the location of exits, ladders, diving board, distance to the pool edge and the inner layout of the pool, the depths, width of the gutters and the water inlets and outlets. To defend this point, Hunt, as well as others, noted "before swimming or water play, blind swimmers must be thoroughly acquainted with the pool - its composition;
Fig. 1.—A totally blind child finds her swimming locker with the Braille name tag.

Fig. 2.—Kickboards mark the pool edge.
its length, breadth, and depth; its edges; and the kind and position of its ladders." It is, therefore, important that the swimming teacher ascertain the blind child's previous experience in the water and around a swimming pool in order to orientate him adequately to the environment, attempt to prevent any disorganization in relation to space or develop any needless or unwarranted fears.

The depth of the pool is important for the orientation of the blind. Rogers advocated a need for "...at least 10 feet of shallow water to facilitate the teaching of small beginners." The experimental pool had a minimum depth of forty-two inches. Since it was not possible or practical to lower the water prior to each swimming period it was felt some method had to be devised to assure each teaching area of "shallow water." In order to meet the problem the writer placed aluminum tables in the water at the edge of the shallow area. These tables stood twenty-nine inches high and allowed for a water depth of thirteen inches. The tables were placed in the same area each time so the children could recall their position. The tables provided a

66 Valerie V. Hunt, op. cit., p. 96.
firm support for the children; they were adequate for the small stature and weight of those in the program and their supreme value was that they provided a "base" or a good working-teaching-practice area. (See Figures 3 and 4, page 45.)

2. The Locker and Dressing Facilities

Each locker had a name tag in Braille plus a chalked name and number (see Figure 1, p. 42). The children had the same dressing area each lesson and used the Braille name tag quite satisfactorily at the beginning of the swimming period. The Braille tag proved inadequate after the child was wet because the children had difficulty reading the Braille with wet hands.

The chalked-on names and/or the numbers on the locker helped the teachers and the guards locate the children.

3. The Showers

A life guard turned on the showers for the children. The water noise assisted the youngsters in finding the shower and orienting themselves to the pool-dressing area.

Toward the end of the program the children, with supervision of the teacher and/or life guard, were allowed to turn the showers on or off.
Fig. 3.—Aluminum tables provide a "shallow" water teaching area.

Fig. 4.—Breathing practice from the table area.
Each group of children per instructor showered in the same shower on the way to the pool. This plan enabled the "threesome" to go to the pool together if they wished and helped the assistant classify or group the children for the proper teacher. Since the showers were a "newfound" experience for many children it often was necessary to "rush" them through prior to the lesson to prevent too much playing or standing under the water.

E. Objectives

The objectives for the teaching of swimming to partially seeing and blind children do not differ greatly from those of teaching sighted children with the exception of hoping that the knowledge of this skill will enable the blind child to utilize the experience in making social acquaintances and in gaining self-acceptance, as well as attain some qualities of improved physical development.

The American Red Cross noted the objectives of swimming instruction in a fourfold listing: (1) to teach the individual to swim or to swim better; (2) to provide wholesome activities that are meaningful and enjoyable; (3) to aid in developing or maintaining organic strength
and vigor, and (4) to improve the morale of the individual. 68

Considering the above criteria and the age of the children, the writer further attempted to define and state the objectives of teaching swimming within the experimental unit for the blind and partially seeing youngsters. The listing shows an overtone of the Red Cross criteria and references of sport activities and recreation for the visually handicapped. The purposes are -

1. To develop within the child a feeling of achievement, satisfaction and accomplishment through the performance of a physical skill.

2. To assist the child in developing enough skill so the activity of swimming may become an avenue for recreational enjoyment.

3. To assist the individual in obtaining a feeling of "at homeness" in the water; to help the individual acquire a feeling of well-being, a release of tension and a feeling of relaxation.

4. To teach the child the fundamentals of maintaining the body on the surface of the water by means of one of the basic skills or strokes, and by this learning develop an awareness to personal safety.

With little further reference to the physical setting it is important for the reader to bear the objectives in mind as the experimental design unfolds.

CHAPTER IV

THE EXPERIMENTAL UNIT

Methods

Three methods which comprised the experimental unit had a common base, the Red Cross outline, and a common aid, the kickboard, but differed in the manner of presentation to the blind and partially seeing children. Kickboards were used in all methods because of their general availability and value in developing coordination, balance and endurance. Since they were placed about the pool as safety measures they were accessible.

Three methods were used in the instructional unit:

Plan A, pure instruction.—All games and aids with the exception of the kickboard were excluded. Twenty-one children followed plan A. This was a larger number than plans B or C because this plan was being compared to plan B and C.

Plan B, mind pictures and games.—Skills of the Red Cross program were presented by means of games and mind pictures. This method endeavored to approximate, as much as
possible, the child's school games and activities and was de-
veloped around his awareness, experience and familiarity with
objects and things in the environment. Nine children were in
this method.

**Plan C, artificial aids and music.**—The use of life
jackets, flippers, inner tubes and board floats plus music,
piped both above and under water, constituted the devices
used by the teachers of swimming for the fourteen children
of Plan C.

**Preliminary Knowledges**

The objectives of the swimming program and the
physical setting have been described in Chapter III. Prior
to a complete discussion of the three methods of teaching in
the experimental unit it is essential to consider two
factors; the over-all methods of teaching swimming, and the
age characteristics and the developmental goals of children
within the experimental age range. This need is to develop
a common awareness to the reader of the many patterns, trends
and ranges in the learning process and the limitations which
may be imposed upon the child.
Over-all Methods of Teaching Swimming

It has been stated "...good swimming is based fundamentally upon good instruction, and good instruction is founded primarily upon thorough understanding of the fundamental principles involved."^69^ Hence, the teacher's job is to help the students understand the mechanical principles of swimming in addition to employing her knowledges in the light of attributing factors - motivation, nutrition, fatigue, over-stimulation, tension and over-protection - as they affect the environment and/or the individual.

**Progressions.** — It has been recommended that the teaching of swimming be an orderly sequence of progressively arranged steps providing opportunity for the individual to proceed at his own rate. ^70^ This plan should be predominate in all situations - for blind or sighted. Degnan noted that progress often was slow and that corrections were often a necessary part of the program to countermand the wrong concepts developed by the blind swimmers. ^71^ Methods in this

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^71^ Walter Degnan, *op. cit.*
case may need revision or examination by the teacher to determine the future course outline or objectives. Gillogly, Edgeditch, Belenky, and Buell listed their personal teaching plans and the writer found each method to include essential progressions and terminology advocated throughout the present day Red Cross outline. Orientation, review and a "natural" manner or approach were consistent recommendations.

Procedure eliminations.—Although land drills are part of the Red Cross outline for swimming within the experimental plan, land drills were passe because of the writer's belief that the blind or partially seeing child had numerous problems of kinesthetic awareness in relation to himself on land and in the water and that many of the perceptions changed with the element of being in water. Since actual water work and water learnings were the objective, drills were carried out in the water in order to enable the child to feel the pull of the water rather than thrash his arms and hands in space.

74 Robert Belenky, op. cit.
75 Charles E. Buell, Personal letter, February 9, 1959.
Warm-up exercise on the deck also was eliminated. Including the above reasons for exclusion, it was felt that pool conditions, temperature and time did not warrant the necessity of the procedure.

Common patterns.—In addition to the orderly sequence of progressively arranged steps there were measures taken to allay fear, i.e., "tour around the pool," general orientation and individualized rate of progression. Also, all strokes and progressions were taught on the whole-part method. Each stroke was considered as a unit in itself. Thus, the misinterpretation that all leg kicks, all arm kicks and then the coordination be taught was eliminated from the instructional unit.

In general, the leg kick was taught first due to the power and the general force the child could realize from this learning. Arm strokes often were taught after the natural attempts had developed. Coordination and timing resulted after continued practice.

The use of a "new teaching vocabulary" was not a necessary part of teaching the blind for the children often used the term "see," or "let me see;" and seemed quite eager to "see" their classmates or teacher by means of a tactical "sight."
Age Characteristics and Goals of Children within the Experimental Age Range

The listings of Cowell and Hazelton were selected to act as a guide for the teacher in the evaluation of the progress of her pupils. It was hoped that the brief outline would aid the student teacher in the understanding of the children in her group. The listings do not include all traits, for the writer selected a few that she felt pertinent to the blind child as well as to the child with normal vision.

Age Characteristics: Grades 1 and 2

Physical characteristics:
1. Reaction time is slow; coordination poor
2. They are active, energetic, and responsive to rhythmic sounds

Mental characteristics:
1. Short attention span
2. Curious, wants to find out things
3. Repetition of activities enjoyed
4. Reasoning ability limited
5. Creative desire present. Highly imaginative

Social and emotional characteristics:

1. Dramatic, imaginative, and imitative; curiosity strong

2. Right is that which wins approval or provides satisfaction; annoyed by conformity

3. Does not accept criticism too well

In the aquatic area some of the Development Goals were:

Creativeness and Understanding:

1. Understands the need for sanitation - why a soap bath prior to swimming

2. Knows the safety value of knowing how to swim

3. Develops wholesome respect for water

4. Understands that people can float

5. Understands the importance of following regulations and instructions

6. Knows the bare fundamentals of swimming

7. Understands how to breathe properly while in the water

8. Knows when to go into the water and when not to go in

9. Understands the principles necessary to be a successful swimmer

Ibid., p. 150.
Social and Emotional Adjustment:
1. Learns to cooperate with the teacher and to do his best
2. Understands proper behavior (etiquette) in water
3. Appreciates that activity in water can be fun
4. Appreciates safety precautions around water for self and others
5. Develops confidence in the water

Organic Power and Skill:
1. Learns correct methods of elementary strokes
2. Develops proper breathing
3. Is able to apply a sense of rhythm to swimming movements
4. Makes progress in developing endurance
5. Develops the use of buoyancy as applied to floating

Age Characteristics - Grades 3 and 4

Physical characteristics:
1. Improved body coordination
2. Poor posture may be present
3. Physiologically, the girls are almost a full year ahead of the boys
4. Sex differences are not of great consequence
5. Individual differences distinct and clear

\textsuperscript{78} Ibid., pp. 166-167.
Mental characteristics:

1. The attention span is increasing; child is developing a sense of achievement

2. Reasoning ability is increasing because the pupil has had more experience

3. Is imaginative; loves rhythmical sounds and movements

4. Adult approval is strongly desired

Social and emotional characteristics:

1. Easily excited; easily hurt by criticism

2. At times, likes to brag

3. "Showing off" is not uncommon

4. Strong curiosity exists

5. Tends to compare himself with others and shows concern over lack of skill, failure, and loss of prestige

In the aquatic area the Developmental Goals selected were:

Creativeness and Understanding:

1. Understands buoyancy
   a. The water will hold him up if he relaxes

2. It is harder to get to the bottom than to come to the top

3. Swimming under water can be fun

Ibid., p. 170.
4. A person who "fights" the water makes little progress
5. Proper breathing is necessary in water
6. Safety practices are important
7. Progress will come faster if he takes one thing at a time
8. Knowledge of water sports, and how they serve and contribute to enjoyment
9. Knowledge of the basic swimming strokes
10. Learn to respect and not to fear the water
11. Form improves with practice
12. Mobility in the water is similar to that on land

**Social and Emotional Adjustment:**
1. The child develops pool etiquette
2. The child develops good health habits in and around the pool
3. Realizing safety for himself and others in and around the pool is important
4. Understands breathing with confidence in water relieves fear
5. Being able to swim develops a feeling of security

**Organic Power and Skill:**
1. Progress in ability to tread water, to float, and to master fundamental strokes
2. Coordinates breathing with proper movements
3. Develops endurance
4. Able to dive into the water
5. Develops proper form
6. Knows proper entries into the water
7. Develops ability to swim in a straight line and to change directions

Skills Included in the Experimental Unit

In regard to the skills taught throughout the three methods the writer selected the small and simple skills as the major constituent of the instructional swimming program.

The skill areas were -

1. Basic skills
2. Swimming skills
3. Safety skills

Inclusive within each area were the following sub-skills:

1. Basic skills
   a. breath control
   b. prone float (face float) and recovery
   c. back float and recovery
   d. turn over
   e. elementary stroke (beginning and/or elementary backstroke with arms and flutter kick)
   f. kicking - on face and back
   g. "dog paddle"

2. Swimming skills
   a. alternate breathing
   b. jelly fish float
   c. glides (front and back)
   d. elementary crawl and finning
e. change of directions
f. leveling off
g. jumping from side
h. flutter kick for distance (front and back)
i. "distance swim" - approximately 12 yards

3. Safety Skills

a. personal safety in aquatics measured by a knowledge survey
b. personal safety in the water measured by the individual's ability to control his movements in 4 - 5 feet of water
c. personal safety in small craft measured by practical experience in a canoe

Skills for the Visually Handicapped

In the skills taught to the visually handicapped the American Red Cross advocated (1) the introduction of basic safety skills as quickly as possible and (2) the teaching of any stroke or stunt the student was able to learn. It further stated "Strokes in which the ears remain at or above the surface are usually more satisfactory because of the necessity for the student to utilize the sense of hearing."  

Belenky stressed the value of the stroke which would enable the blind person to keep his head above the water. He stated - "...the side and breast stroke take first place and the American crawl stroke and others in which rhythmic

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80 American National Red Cross, Swimming for the Handicapped, Instructor's Manual, p. 34.
breathing is of importance move out of the limelight."\textsuperscript{81}

It was not the intent of this report to discuss strokes or to develop any criteria regarding which stroke or skill the blind child should learn first. Rather, the design of the study was to evaluate three experimental methods of teaching the blind to swim. However, throughout the text of this study emphasis has been placed upon the social and psychological development of the blind child. With this immediate concern in mind and with the belief that swimming needs little adaptation for the blind, the writer attempted to keep all of the instructional methods similar to those which might be employed for a sighted child. Since the side stroke was not a "socially acceptable" stroke to the younger generation and since many of the coordinations are quite involved, the progression of the experimental program was toward the crawl. Primarily, the first series of lessons stressed a basic stroke and a relief stroke \textit{i.e.}, back float, fin and kick. In defense of this, Scully noted the need for "a basic stroke, a relief stroke and any

\textsuperscript{81} Robert Belenky, \textit{op. cit.}, p. 7.
additional skills best meeting needs of developing coordi-
nation, endurance, respiration and circulation." 82

The Six Over-all Areas Covered in Instruction

1. Physical and Mental Adjustment to the Water

The American Red Cross manual stressed the value of this phase due to the fact that in the water the water pressure inhibited breathing, water on the face caused dis­comfort and cool water in the ears, nostrils, and on the hair was distasteful. 83 An attempt was made to overcome tensions, resulting from fear and other emotional stress, so the learn­ing of the correct responses and skills could be accomplished.

2. Buoyancy, Body Position and Relaxation

Armbruster showed that the laws governing man's be­havior in water differed from those of air and land. He further showed that gravity laws assumed opposite manifesta­tions and the loss of body weight and feelings of instability often handicapped the inexperienced novice. 84 This area

83 American National Red Cross, Swimming and Diving Courses, p. 2.
stressed relaxation and the ability of the individual to adapt to natural and physical changes in the water.

3. **Propulsive Movement, Changing Positions**

4. **Coordinated Stroking**

5. **Methods of Entering the Water**

6. **Safety Skills**

Within areas 3, 4, 5 and 6 steps were taken to overcome any fear of drowning and to make the child "safety conscious" and secure in the water.

The six over-all areas were developed within the three experimental plans.

The Experimental Design and Methods of Teaching

**Plan A - Pure Instruction**

This method was based upon the standard Red Cross method as listed in the Red Cross Instructor's Manual.

Since much of the blind child's training and environmental setting was based upon instruction and the repetition of patterns and techniques, it was felt that one method of teaching should follow a direct teacher to student relationship. The teachers were instructed as to the method and experimental teaching content; they did not use games, flotation devices (flippers, life jackets), or music.
The six over-all areas of Plan A included the following:

1. **Physical and Mental Adjustment to the Water**
   a. Orientation: little instruction was given in this phase of learning other than to tell the individual what to do, plus acquaint him with the physical setting
   b. Hand to hand wade
   c. Submersion
   d. Breath-holding to a count of 5, 10
   e. Blowing of bubbles
   f. Kicking-holding the side. Kicking 20, 50, 100 times with rest intervals

2. **Buoyancy, Body Position and Relaxation**
   a. Jelly-fish float
   b. Prone float (face float)
   c. Recovery to a standing position with assistance
   d. Floating on the back with assistance
   e. Recovery to a standing position without assistance
   f. Rhythmic breathing (bobbing)

3. **Propulsive Movement, Changing Positions**
   a. Prone glide (face glide) with the assistance of a push from the wall
   b. Kick glide on front
   c. Kick glide on back
   d. Arm stroke on the back (finning)
   e. Arm stroke on the front (dog paddle)

4. **Coordinated Stroking**

   Skills in this section ranged from rather crude thrashings to fairly coordinated movements. The basic skills included -
a. Combined stroke on the front (usually a two beat stroke with some type of alternate breathing)
b. Combined stroke on the back (elementary back stroke arms and flutter kick)
c. Change of position - front to back, back to front
d. Change of direction without stopping or placing feet on the bottom of the pool
e. Levelling off

5. **Methods of Entering the Water**

Performance showed quite a range of skills within this section:

a. Beginner's jump in shallow water
b. Beginner's porpoise dive (shallow - head first leap)
c. Head first dive
d. Standing jump into deep water

In the above, skills c and d required deep water areas with the prerequisite of knowing how to swim in deep water, the back float, and the ability to swim 20 yards without assistance.

6. **Safety Skills**

Skills in this area included -

a. Personal safety - measured by a distance swim (20 yards non-stop and a back float for one minute)
b. Safety in small craft - a basic knowledge of what to do; practical work in a canoe
Plan B - Mind Pictures and Games

The Red Cross method as described in the Instructor's Manual also was the bases for Plan B. The six areas of instruction were taught through the media of mind pictures and games developed by the instructor and the children in the experimental plan. If one were to examine references on the teaching of swimming, one would find differences as to the value of this approach and its application for the blind.

Allen stated that "...the blind must be made to forget themselves - to get out of themselves. Games provide the very best means to this end." 85

Fear of the water, according to Hewitt, might be gradually overcome by building games around the object feared. 86 The Red Cross stated "...to allay fear games may be played composed of the skills as they are mastered." 87

The psychological study by Deutsch provided the writer with some verbal descriptions of objects in the blind

87 The American National Red Cross, Swimming and Diving Courses, p. 23.
child's perceptual world. Throughout the results of the study, the writer noted similarities and differences between the boys and the girls and the many concepts which could be applied to the aquatic experience. For example, the study showed the children drawing an analogy to a cup as a nest, egg shell and a basin. In explaining a front glide from the table, one child noted "like a little bird pushing off a nest." This statement became a "game" and with each successive attempt at the front glide it was "Little bird, come." Games often developed from the comments as a result of the child's concept of things of the seeing environment. The value of the mind picture game approach, has not received all-favorable acclaim because it is believed that the blind are unable to develop concepts of "mind pictures."

If mind pictures are to be used they should be selected with care and regard for the child. Lowenfeld strongly advocated that

...the seeing educators of blind children must make every effort to have his children experience the world through their own senses without imposing upon them the visual approach that dominates his own observation, experiences, and imagery.89

Thus, one finds the strengths and weaknesses of this method differing. Referring to the listing of Cowell and Hazelton\(^9\) one notes the games and mind pictures as an important part of the young child's age characteristics and development. Therefore, Plan B was undertaken to determine its effectiveness for the blind child and its strength against two other methods of teaching.

Plan B - **Mind Pictures and Games**

1. **Physical and Mental Adjustment to the Water**

<table>
<thead>
<tr>
<th>Skill</th>
<th>Game or Mind Picture</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. orientation to the pool</td>
<td>&quot;around a shoe box;&quot; feeling the inside of a box</td>
</tr>
<tr>
<td>b. hand-in-hand wade</td>
<td>Follow the leader; train.</td>
</tr>
<tr>
<td>c. submerge</td>
<td>Taking a bath in a deep tub; bar of soap on the bottom of the tub</td>
</tr>
<tr>
<td>d. breath-holding</td>
<td>Blowing up a balloon in the chest</td>
</tr>
<tr>
<td>e. blowing bubbles</td>
<td>Motor boat; kitten purring</td>
</tr>
<tr>
<td>f. kicking</td>
<td>Running or walking fast in the water; motor of car. (Kickboards were called &quot;kick boats&quot;)</td>
</tr>
</tbody>
</table>

2. **Buoyancy, Body Position and Relaxation**

| a. jelly fish float | Ivory soap float; float like a turtle on top of the water |

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\(^9\) Charles C. Cowell and Helen Hazelton, *op. cit.*., pp. 147-170.
| b. prone float (face float) | Cotton float; "little bird-fly"
|---------------------------|----------------------------------|
| c. recovery to standing position | Bunny hop; leap frog
| d. back float | Sleeping on back on a bed--a feather bed
| e. stand after back float | Tumbling stand (stand after forward roll); cradle rock
| f. rhythmic breathing | Motor of car; blowing bubbles with a straw

3. **Propulsive Movement, Changing Position**

| a. prone glide (front glide) | Indian's canoe on quiet lake; sliding on your stomach in the snow
|-----------------------------|---------------------------------------------------------------|
| b. kick glide on front | "Motor boat;" kicking feathers to the sky; walking feet
| c. kick glide on back | Kicking off the covers as you lie on your bed
| d. arm stroke on back (finning) | Like taking off slacks and pulling them on again (just using arms)
| e. arm stroke on front (dog paddle) | Digging a hole in the sand; pulling on a rope from a deep well

4. **Coordinated Stroking**

| a. combined stroke on front | Crawling through mud lifting arms high; walking through a corn field, moving corn stalks
|-----------------------------|--------------------------------------------------------------------------------|
| b. combined stroke on back (elementary back stroke arms and kick) | Game: "I pull my arms up high and circle them around;" row the boat
c. changing positions | Rolling down a hill; rolling over in bed; rolling in autumn leaves; "Change the record"
d. changing direction | Game: swim around the corner
e. levelling off | Jump up on a high box and land on tummy

5. **Methods of Entering the Water**

a. jump in shallow water | Bunny hop; spaceman; puddle jump
b. porpoise dive | Turtle roll; do-nut leap; "tumble-tumble"
c. head first dive | Slide down a steep hill on tummy - get pulled up by hands
d. jump into deep water | Bunny hop; spaceman; puddle jump. Stress long jump

6. **Safety Skills**

a. distance swim | A long trip
b. small craft safety

Games and mind pictures were not exclusively employed in the teaching of safety skills.

No formal terms were used in phases 1 through 5, inclusive. There was some overlap in phase 6 due to the random grouping of children in the canoe and the necessity of standardizing the safety question sheet.
Plan C - Artificial Aids and Music

Again, the Red Cross outline was the base of the method. Flotation devices of inner tubes, children's life jackets, plus flippers were used. Music used was piped above water and underwater by means of underwater speakers.

Aids were introduced to the program after the first lesson in phase 1, physical and mental adjustment to the water. The writer felt the lessons without aids would facilitate student-teacher rapport and provide the child with a better physiological-psychological adjustment.

During phase 1, the teacher supported the child.

1. Physical and Mental Adjustment to the Water
   No aids or music first lesson

2. Buoyancy, Body Position and Relaxation
   Life jackets, tubes, flippers and use of boards as floats - music

3. Propulsive Movement, Changing Positions
   Same as above without board floats

4. Coordinated Stroking
   Life jackets, fins, music

5. Methods of Entering the Water
   Life jackets, music

6. Safety Skills
   Life jackets, music
For the beginning swimmer the Red Cross has stated:

Artificial aids to learning should be used very little, if at all, in teaching the non-swimmer, since they cause him to depend upon them at a time when all effort should be bent upon learning self-reliance. 91

Keifer and Gabrielsen placed swimming aids into two groups: first, those primarily intended for amusement and fun; and second, those an aid in learning to swim or a safety device. 92

Although the Red Cross does not support the use of aids for beginners there are several teachers of swimming proclaiming their value.

Hewitt stated that "...fear loses its power over the individual once it is challenged....adequate support should be provided until progressive skills are mastered." 93

Historically speaking, Wetmore related how the idea of using artificial aids for teaching non-swimmers was not

91 The American National Red Cross, Swimming and Diving Courses, p. 10.
new but that their use had been somewhat limited because many instructors felt that the transitions to no support were too great for the average beginner.

Fins.—Belenky found that when used judiciously fins were of inestimable value. He listed the fins as the basic instrument for teaching the beginner and noted that if used correctly the equipment should help to develop self-confidence. A limitation to use was the danger that the user might become "addicted" to them and not acquire the confidence to swim well without their support. The fins used in the experimental unit were of light weight rubber. (See Figure 5.)

Tire tube.—It was important that the child assume a position within the ring of the tube for balance and the "feeling of support." Tubes were partially deflated to allow them to float lower in the water and become more stable. (See Figure 6.)

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Fig. 5.—The use of lightweight fins.

Fig. 6.—Partially deflated tire tubes.

Fig. 7.—Coast Guard approved life jackets.
Life jacket.—Wetmore stated that "exclusive use of a life jacket during the initial stages of learning to swim enabled a beginner to acquire skill in swimming more efficiently than would be possible without the aid of a support." He further stated that the use of the life jacket enabled the beginner to overcome three of the major obstacles in learning to swim; namely, his inability to float, his lack of muscular endurance and his difficulty in breathing. McAllister noted that the life jacket was the safest of all devices, but that it gave too much support to the body to be used for too long a period. The life jackets in the instructional program were regulation Coast Guard approved for small children (see Figure 7, page 73).

Kickboard.—The kickboard was used as an aid to body balance or kinesthetic awareness. The board was placed between the feet, under the body (under the child's seat) or on top of the body allowing the child to take a firm grasp of the board (see Figures 8, 9, 10).

With any flotation device as well as with any of the methods, limitations were developed in accordance with

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96 Reagh C. Wetmore, loc. cit., p. 40.
97 Ibid.
Fig. 8.—The kickboard placed under the hips to teach the fundamentals of floating.

Fig. 9.—The kickboard held on top of the body for support.

Fig. 10.—The kickboard placed between the legs helps the child assume the horizontal position.
water depths, swimming areas and general swimming ability.

It also may be of value to the reader to note that the use and reliance upon the artificial supports did not comprise the total instructional program of the beginner; there were drills without aids when the child developed some confidence in the teacher and in himself. Several children rejected the total use of the life jacket after the first few lessons, after they had made some adjustment to the water. In regard to the use of aids, particularly the jacket, Wetmore proclaimed "work with the life jacket must be supplemented with drills on bobbing, gliding, underwater swimming, diving and other skills which improve general ability in the water." 99

Music.—Rhythm in swimming is essential. The Red Cross stressed counting, descriptive words or music to aid in this development. 100 In the experimental program, music had its value in helping the children relax, feel the correct rhythm and smooth out any jerkiness of movement. In work with non-swimmers Yates 101 noted that music aided

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99 Reagh C. Wetmore, op. cit., p. 40.
100 American Red Cross, Swimming and Diving Courses, Instructor's Manual, p. 5.
in producing an efficient stroke in a shorter length of time.

Dillon summarized the influence of music when she noted:

First, the swimmer is aided because the rhythm of the music may help him to feel the rhythm of the stroke being executed; second, the introduction of music in many cases brings about a greater degree of relaxation and lessens the amount of tenseness on the part of the swimmer; and third, the learning process becomes fun.102

Summary:

The experimental unit involving methods A, B, and C, dealt with the preliminary knowledge of progressions, and common teaching patterns and procedures. Age characteristics and developmental goals were applied to the teaching unit to orient the student teacher to the age interests and behavior patterns of children.

The skills of the experimental unit were comprised of the standard Red Cross beginner skills plus additional personal skills to measure the visually handicapped child's ability to be independent. The skills were designed to allow each child a sufficient number of "passed" skills.

The skill areas of the unit were divided into three groups: (1) the basic skills; (2) the swimming skills; and (3) the safety skills.

The six over-all areas of instruction included: (1) Physical and mental adjustment to the water; (2) Buoyancy, body position and relaxation; (3) Propulsive movement, changing positions; (4) Coordinated stroking; (5) Methods of entering the water; and (6) Safety skills.

The experimental design allowed for little change or adaptation in Plan A - Pure Instruction. Within Plan B - Mind Pictures and Games there was an opportunity for flexibility and student participation in planning. Plan C - Artificial Aids and Music included many motivating and psychologically stimulating devices. The use of aids was defended by well-known swimming authorities.
CHAPTER V

RESULTS OF THE STUDY

I. Material Included in the Study

In light of what is known about teaching methods, performance and individual differences, the teachers of swimming, somewhat accustomed to the visual approach in teaching the aquatic skills, may, when teaching a blind child, find themselves confronted with questions and problems influential to their effectiveness in working with the visually handicapped. It seems, therefore, of inestimable value to examine some of the concerns related to the teaching of swimming by viewing the following questions often asked of the experimental program:

1. Can the visually handicapped child learn to swim?

2. Which skills are easiest for them to accomplish? Which skills are more difficult?

3. How do you measure progress?

4. What skills are included? Why?
5. Is there any particular way (method) for teaching the blind?; the partially seeing?

6. Do the performances of the blind differ from those of the partially seeing?

7. Are there any performance differences shown between the young boys and girls?

8. Are there any performance differences shown due to learning ability (I.Q.)?

9. Should strokes be adapted for the blind and the partially seeing?

10. What performance faults are most common?

II. Skill Performance Criteria

In order to evaluate these questions and find answers as they pertain to the blind of the experimental group a listing of "swimming skills" was prepared. The skills comprised many of the basic Red Cross progressions, plus a number of additional "personal" skills deemed important for the blind child's concept of self-importance and the measure of accomplishment. Basically, twenty skills within the area skills—the basic skills, swimming skills and safety-skills—formed the measures for the performance evaluation. They are to be evaluated throughout the chapter.
with a major emphasis and reference placed upon **methodology** and its relationship to observed, measured performance within the experimental unit.

The passing of a skill depended upon the satisfactory performance of the skill as described in the appendix. A consistent pattern was required before the skill was passed. Accomplishment was recorded on a skill chart written in Braille. String subdivided areas; thumb tacks marked a passed skill (Figures 11 and 12).

**The twenty skills.**—The skills of the testing unit were as follows:

**Skill**

1. Dress and shower.
2. Sit on the side of the pool and kick feet in the water.
3. Sit on the table and splash water over one's self.
4. Slide from the table and touch the bottom of the pool with toes.
5. Put face in water.
6. With face in the water, hold your breath for 10 seconds.
7. Blow bubbles (rhythmic breathing).
8. Hold side and kick 20 kicks.
10. Face float and stand.
13. Front glide and kick.
15. "Dog paddle" or "human stroke."
17. Turn over.
Fig. 11.—The swimming skill chart. Note the Braille names and skills, the string dividing areas, and the thumb tacks for accomplishments.

Fig. 12.—A child passes another skill.
18. Level off.
19. Jump from the side into shallow water.

The twenty skills were subdivided for graphical presentation in order that the percentage ratings and skill performance could be measured for all groups: the total experimental group; the blind of the experimental program; and the partially seeing of the experimental program. Several divisions of the skills were made:

1. Preliminary skills (1, 2, 3, 4)
2. Elementary learning skills (5, 6, 7, 8)
3. Floating skills (9, 10, 11)
4. Swimming skills (12, 13, 14, 15, 16)
5. Safety skills and safety knowledge skills (17, 18, 19, 20)

The preliminary skills, skills 1, 2, 3 and 4, were passed by 100 per cent of the children in the experimental program (see Figure 13). The skills were included as a part of the program because of two factors; first, the children needed to gain assurance in their ability to perform these basic tasks; and, second, they provided even the smallest, least capable child with an opportunity to have "many" check marks on the skill chart.
Fig. 13 - The Preliminary Skills

Fig. 14 - The Elementary Skills
With the elementary learning skills, skills 5, 6, 7 and 8, there were some similarities and some differences in performance between the blind and the partially seeing. Ninety-two per cent of the blind children passed rhythmic breathing, skill 7, with the partially seeing close - with 89 per cent; there was a marked reversed trend for breath-holding, skill 6. The partially seeing showed 84 per cent passing whereas the blind group showed 48 per cent passing. (See Figure 14.)

The writer found no concrete reason for this difference and attributed it chiefly to the fact of orientation or "contact." The blind child uses his auditory sense to orientate himself to his surroundings; by placing his head in the water he is virtually "cut off" from his surroundings. The 10 second breath-hold might have been an alarming experience for the blind. It was noted that the motion of blowing bubbles and rhythmic breathing seemed to appeal to the blind children.

The jelly fish float, skill 9, was satisfactorily accomplished by both the blind and the partially sighted child; the partially sighted held a slightly better score. In the face float and stand, skill 10, and the back float and stand, skill 11, the blind exceeded the performance of
the partially seeing with the picture scores of 68 per cent to 53 per cent, and 52 per cent to 42 per cent (see Figure 15).

The writer believes the performance differences were chiefly due to confidence developed within the child for his performance and the actions or responses of his teacher. Also, the writer feels motivation played an important role, and that the inability to see or observe space relationships, fear or other children's attempts and failures aided the blind child in the performance of the floating skills, skills 9, 10 and 11.

The blind exceeded the partially seeing in most of the swimming skills, skills 12, 13, 14, 15 and 16. The decline on the part of the partially seeing might well be attributed to greater hesitation due to observation of faults or achievements of others, or it may have been as a result of a general caution of this group to "plunge" forward and try the skills. It also was felt the small degree of sight might have hindered the child in his ability to form a movement pattern from verbal descriptions, or that the demonstrations might have been misinterpreted or ignored because of the many "interrupting" or "visual interest" items surrounding the experimental area. It is interesting to note
too, nearly equal percentage performance ranking on skill 16, the crawl stroke. (See Figure 16.)

The writer believes the factor of a slight degree of sight hindered the partially seeing in the safety skill performance of skill 17, the turn over. Scoring showed that 52 per cent of the blind children completed this skill, while only 32 per cent of the partially seeing were able to complete the skill.

Next to the breath-holding score, the second greatest skill performance of the partially seeing was shown in skill 19, the jump from the side. They showed a 63 per cent pass while the blind showed 52 per cent, and the total group average was 57 per cent. It seems the little sight was of value for this particular skill. (See Figure 16.)

The safety knowledge test was passed by 32 per cent of all groups. Although the general safety knowledge was somewhat greater, the two survey questions (1) "When you are swimming and get tired what should you do?" (2) "What should you remember when you go to swimming areas, lakes, pools?" had to be answered by the children without probing or supplementary information from the teacher to have the skill count for full credit. (See Figure 17.)
Fig. 15—The Floating Skills

Fig. 16—The Swimming Skills
Fig. 17—The Safety Skills & Safety Knowledge Skills
III. Area Skills

The basic skills were deemed essential for the aquatic development of all the children and included the elementary skills, skills 6, 7 and 8; (6) face in water, breath-holding; (7) blow bubbles, rhythmic breathing; (8) hold side and kick; and two of the floating skills, skills 10 and 11; (10) face float and stand and (11) back float and stand plus one basic swimming skill, skill 15, the "dog paddle," and the safety skill, skill 17, the turn over.

In most instances the blind child did better than the partially seeing child. The percentage of skills passed was, in most instances, above 50 per cent. The average percentage of skills passed for the total group was 58 per cent; for the blind, 64 per cent, and for the partially seeing, 57 per cent. (See Figure 18 for isolated skill analysis.)

Swimming skills included one floating skill, the jelly fish float, selected as a swimming skill because of the body position in the water and the relative lack of total support and additional swimming skills 13, 14 and 16, the front glide and kick and the back glide and kick and the crawl stroke. Safety skills pertinent to this area included
Fig. 18 - The Basic Skills

Skill

Percent Passing Skill

Portfolio seeing
Blind
Total group
skills 18 and 19, level off and the jump from the side. (See Figure 19.)

The partially seeing surpassed the skill performance of the blind in all but two skills, skill 13, the front glide and kick; and skill 14, the back glide and kick.

The total group passed the skills with an average of 55 per cent; the blind showed a 55 per cent pass and the partially seeing a 56 per cent pass. The average performance of all groups in this area takes on more of an equaling quality than the average of the basic skills.

The safety skills included some of the skills from the other areas, basic skills and swimming skills. Those taken from other areas included skill 17, the turn over; skill 18, the level off; and skill 19, the jump from the side. Basic to the safety skills was the safety swim, or "distance" swim, the 20 yards non-stop swim in any direction, and the safety knowledge inquiry previously described. (See Appendix I.)

Because of the addition of the distance swim in this area, criteria for the average percentage ranking differs somewhat from those previously discussed under safety in section II, page 87. Performance percentages for the group showed the total group with 40 per cent; the blind with
Fig. 19.—The Swimming Skills
39 per cent and the partially seeing with 39 per cent. (See Figure 20.)

IV. Over-all Performance

The performance of the children of the experimental unit were evaluated considering five cross references; (1) performance due to the method of instruction; (2) performance due to visual acuity; (3) performance due to sex differences; (4) performance due to age differences, and (5) performance due to general ability or I.Q.

Emphasis was placed upon performance and method; the particular section being cross checked by all of the above sections.

In addition to observed advantages, differences in skills passed, and methods most satisfactory to each group a statistical evaluation was determined for each area. This analysis consisted of a mean score for each group and area and the use of the t-score. Comparisons of groups and methods were made by determining mean, standard deviations, examining probable errors, and the significant differences between the means.

The number of children of the experimental unit was small, 44 children, and thus the data was handled for a
Fig. 20—The Safety Skills

- Total group
- Blind
- Partially seeing

Distance Swim

<table>
<thead>
<tr>
<th>Percent Passing Skill</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
small group. Observed rating revealed some differences for method and group but on the whole most of the statistical analysis showed little significance. Because of the statistical limitations of the findings, the reader should be cautioned not to discard the findings of this report but use the data available in evaluating teaching approaches in order that he might apply the experimental techniques to more visually handicapped children in other state schools and communities and compare the results, making additional statistical analyses.

1. Performance and Method
   a. Methods A, B and C

   The general purpose of this analysis was to determine the method best suited to the experimental group by evaluating mean performance scores for each method. The three methods held in common the American National Red Cross teaching progression outline and differed in the experimental teaching approach. Plan A was "pure" instruction; Plan B, mind pictures and games and Plan C, artificial aids (flippers, life jackets, tubes) and music.

   Twenty-one students comprised the instruction method, Plan A, and passed three hundred and sixteen skills, showing
a mean score of 15.04; while nine students participated in
the mind picture game method, Plan B, and passed one hundred
and thirteen skills, with a mean score of 12.55. Fourteen
children comprised the aids and music method, Plan C, and
passed a total of one hundred and seventy-seven skills, with
a mean score of 12.64.

From the above analysis the "actual score," or mean
score, showed that the instruction method was best, and that
the aids method was slightly better than the game program.

TABLE 1.—Skill performance and the method of
teaching

<table>
<thead>
<tr>
<th>Plan</th>
<th>Students</th>
<th>Total No. of Skills</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>Standard Error of the Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>21</td>
<td>316</td>
<td>15.04</td>
<td>5.20</td>
<td>1.16</td>
</tr>
<tr>
<td>B</td>
<td>9</td>
<td>113</td>
<td>12.55</td>
<td>6.21</td>
<td>2.20</td>
</tr>
<tr>
<td>C</td>
<td>14</td>
<td>177</td>
<td>12.64</td>
<td>4.70</td>
<td>1.31</td>
</tr>
</tbody>
</table>

Statistically, the differences were not significant,
since the t-test showed no significant differences between the
instruction method, Plan A, and the mind picture game method,
Plan B, or between Plan A, and the aids and music method,
Plan C. There were no significant differences shown between
games, Plan B, and aids, Plan C. Performance of the students
in all methods showed a t-test of .31, which was not significant at either the .05 or .01 per cent level of confidence.

TABLE 2.—Statistical findings to the method of teaching.
Correlation of Plan A-B; A-C; and B-C

<table>
<thead>
<tr>
<th></th>
<th>Plan A Findings</th>
<th>Significant at .05</th>
<th>Significant at .01</th>
<th>Plan B Findings</th>
<th>Significant at .05</th>
<th>Significant at .01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan A</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan B</td>
<td>1.00</td>
<td>2.09</td>
<td>2.85</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan C</td>
<td>1.37</td>
<td>2.31</td>
<td>3.36</td>
<td>.04</td>
<td>2.16</td>
<td>3.01</td>
</tr>
</tbody>
</table>

It was shown the "actual difference," or mean scores, tended to indicate a slight preference for the instructional approach, Plan A. Possibly this finding might be explained by the general environmental routine of the blind or partially seeing child under institutional living and scheduling.

Upon the examination of Plan B, the writer felt the "mind picture and game" approach tended to open a horizon of new experiences for many children, while for some at this particular age-grade level, it taxed their limited experience and knowledges of the "outer world."
Plan C, the artificial aids and music, provided a motivational "lift" to the teaching program, and seemed to be a most worthwhile addition for the teaching of swimming.

Because of the small degree of difference in mean scores between Plans B and C, .09, the writer feels it quite unrealistic to discard either method; and, in the light of the mean score differences between A - B, 2.49, and A - C, 2.40, considering institutional living and its attendant restrictions to the total "freedom" of individuality, one hesitates to list one method as the best for all blind and partially seeing children.

b. The blind versus the partially seeing in methods A, B and C

In an attempt to analyze further the performance of the experimental group as it related to method, the performance of the blind versus the partially seeing was assessed.

Within the instructional method, Plan A, the blind showed a slightly greater actual mean score than the partially seeing. The mean score for the blind was 15.61 skills passed, as against the mean score of 14.12 skills for the partially seeing. Statistically this score was not significant (t = .19).
The mind picture game method, Plan B, again showed the totally blind group slightly superior to the partially seeing. The mean score for the totally blind was 13.00 skills, while the mean score for the partially seeing was 12.00 skills. Statistically, the scores were not significant (t = .20).

Support for this finding was found in a study by Lowenfeld when he stated "Some people with very low vision are able to put it to much better use than others with higher visual acuity." 103 Further, "...this ability may be due to intelligence, environmental influences and heredity inclination toward certain types of imagery and learning - visual, auditory, and kinesthetic..." 104

The trend for the blind to be slightly better than the partially seeing was reversed in Plan C, artificial aids and music. The mean score for the totally blind was 11.71 skills, while the mean score of the partially seeing was 13.57 skills. Statistically, the difference was not significant (t = .67).

Regardless of the performance measures of the experimental group, it is necessary to use caution in

104 Ibid.
prescribing a method, since there are many factors affecting
the motor performance of the visually handicapped child.
Buell listed these factors as (1) amount of vision; (2) du-
ration of visual handicap; (3) attitude of parents toward
the child; and (4) the physical education experiences re-
ceived in school and elsewhere.

c. The blind in methods A, B and C

It has been shown that the performance of the blind
slightly exceeded that of the partially seeing in Plans A
and B, and fell behind that in Plan C. With this data
available a question was raised about the performance of the
blind group in all methods.

Thus it was shown that the instructional method,
Plan A, was the better method for the blind, with the mind
picture-game method, Plan B, ranking second.

| TABLE 3.—Performance of the blind in methods |
| A, B, C |

<table>
<thead>
<tr>
<th>Plan</th>
<th>No. of Children</th>
<th>Skills Passed</th>
<th>Mean Score</th>
<th>( t )-test</th>
<th>Standard Deviation</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>13</td>
<td>203</td>
<td>15.61 X</td>
<td>.73</td>
<td>1.61</td>
<td>5.11</td>
</tr>
<tr>
<td>B</td>
<td>5</td>
<td>65</td>
<td>13.00 X</td>
<td>X</td>
<td>.34</td>
<td>6.48</td>
</tr>
<tr>
<td>C</td>
<td>7</td>
<td>82</td>
<td>11.71 X</td>
<td>X</td>
<td>X</td>
<td>4.68</td>
</tr>
</tbody>
</table>

Statistically, the differences in t-tests showed nothing significant, although there was a correlation close to the .1 per cent level of confidence for Plan A-C. The findings showed a t-test of 1.61. In order for the finding to be significant at the .1 per cent level, the t-test should have been 1.72.

d. Partially seeing in A, B and C

The partially seeing group showed a higher performance mean skill in the instruction method, Plan A, but differed from the blind in that the second method of teaching was Plan C, the artificial aids and music method. This finding might be explained by the partially seeing child's ability to observe enough of the environment to overcome any of the fear of the artificial aids and their lack of support. The child could see the tire or tube and therefore had the ability to orient himself to the surroundings; the flippers added speed and control, and the distances accomplished could often be visually measured or evaluated.

The writer noticed that the partially seeing child sought the aids more readily than the blind child. The fact that the aids were utilized more by the partially seeing also could account for a limitation in statistical findings.
TABLE 4.—Performance of the partially seeing in A, B, C

<table>
<thead>
<tr>
<th>Plan</th>
<th>No. of Children</th>
<th>Skills Passed</th>
<th>Mean Score</th>
<th>t-test</th>
<th>Standard Error of Deviation</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>8</td>
<td>113</td>
<td>14.12</td>
<td>X .48</td>
<td>.19</td>
<td>5.99</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>48</td>
<td>12.00</td>
<td>X X</td>
<td>.36</td>
<td>6.78</td>
</tr>
<tr>
<td>C</td>
<td>7</td>
<td>95</td>
<td>13.57</td>
<td>X X X</td>
<td></td>
<td>4.89</td>
</tr>
</tbody>
</table>

The t-tests showed no significance at either the 1 per cent or 5 per cent level of confidence.

e. Boys versus girls in A, B, C

It has been noted in child development texts that there relatively are no great differences in skill performance between the sexes at the early ages.

Within the experimental unit there were differences in performance between the groups but because of the small sample, differences were not significant. The mean score performance showed the instruction method, Plan A, to be the best method for both the boys and the girls. The mean score performance for the groups showed that Plan B, mind pictures and games, ranked in second place for the girls; while Plan C, artificial aids and music, was second for the boys. The mean performance scores for both groups in Plan C,
artificial aids and music, showed a slight increase for the boys. Statistical data did not show significant scores at either the 1 per cent or the 5 per cent level of confidence.

TABLE 5.—Boys versus girls in A, B, C

<table>
<thead>
<tr>
<th>Plan</th>
<th>Girls Skills</th>
<th>No. Passed</th>
<th>Mean</th>
<th>Boys Skills</th>
<th>No. Passed</th>
<th>Mean</th>
<th>t-test</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13</td>
<td>205</td>
<td>15.72</td>
<td>8</td>
<td>111</td>
<td>13.88</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>7</td>
<td>101</td>
<td>14.43</td>
<td>2</td>
<td>12</td>
<td>6.00</td>
<td>3.08</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>6</td>
<td>74</td>
<td>12.33</td>
<td>8</td>
<td>103</td>
<td>12.88</td>
<td>.18</td>
</tr>
</tbody>
</table>

f. Boys in A, B, C

Within the three methods, the mean performance of skills showed a performance preference ranking for Plan A, pure instruction, with a mean score of 13.88 skills; Plan C, artificial aids and music, with a mean score of 12.88 skills and Plan B, mind pictures and games, with a mean score of 6.00.

The number of children in Plan A and Plan C versus the small number in Plan B might well account for the great difference in mean performance scores. Statistical results did not show any significance at either the 1 per cent or 5 per cent level of confidence, although the A, B and the
B, C rankings were close to the 1 per cent level of confidence.

**TABLE 6.—Boys in A, B, C**

<table>
<thead>
<tr>
<th>Plan</th>
<th>No. of Children</th>
<th>Skills Passed</th>
<th>Mean Score</th>
<th>t-test</th>
<th>Standard Deviation</th>
<th>Standard Error of Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>8</td>
<td>111</td>
<td>13.88</td>
<td>X</td>
<td>3.04</td>
<td>.37</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>12</td>
<td>6.00</td>
<td>X X</td>
<td>3.26</td>
<td>1.42</td>
</tr>
<tr>
<td>C</td>
<td>8</td>
<td>103</td>
<td>12.88</td>
<td>X X X</td>
<td>4.12</td>
<td>1.56</td>
</tr>
</tbody>
</table>

**g. Girls in A, B, C**

It is of interest to note the method preference of the girls compared with that of the boys. The score ranking for the girls showed a selection of A, instruction; B, mind pictures and games; and C, artificial aids and music. Although the number of children in each plan differed, the mean ranking is quite similar. Statistical analysis found the scores insignificant at either the 1 or 5 per cent level of confidence.
TABLE 7.—Girls in A, B, C

<table>
<thead>
<tr>
<th>Plan</th>
<th>No. of Children</th>
<th>Skills Passed</th>
<th>Mean Score</th>
<th>t-test</th>
<th>Standard Deviation</th>
<th>Standard Error of Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>13</td>
<td>205</td>
<td>15.77</td>
<td>X .48</td>
<td>5.21</td>
<td>1.51</td>
</tr>
<tr>
<td>B</td>
<td>7</td>
<td>101</td>
<td>14.43</td>
<td>X X .60</td>
<td>5.71</td>
<td>2.34</td>
</tr>
<tr>
<td>C</td>
<td>6</td>
<td>74</td>
<td>12.33</td>
<td>X X X</td>
<td>5.80</td>
<td>2.60</td>
</tr>
</tbody>
</table>

h. Blind boys versus partially seeing boys in A, B, C

There seemed to be a pattern of method selection for each group. The blind boys showed a mean ranking for Plan A, instruction; Plan C, artificial aids and music; Plan B, mind pictures and games. The partially seeing boys selected Plan C, artificial aids and music; Plan A, instruction, and Plan B, mind pictures and games.

The number of children in Plan A differed for both groups, but within Plan B and C the numbers were similar. Findings showed an increase in mean performance of Plan B for the blind boys, while the reverse pattern was shown for the partially seeing in Plan C.

i. Blind girls versus partially seeing girls in A, B, C

The blind girls and the partially seeing girls showed a common picture in method selection, with each group showing mean ranking for Plan A, instruction; Plan B, mind
pictures and games; and Plan C, artificial aids and music.

The number of children in groups A and B differed. The mean performance for the partially seeing girls exceeded that for the blind girls in Plan A, while the blind girls exceeded mean performance in both Plan B and Plan C.

TABLE 8.—Blind boys versus partially seeing boys in A, B, C

<table>
<thead>
<tr>
<th>Plan</th>
<th>Skills Passed</th>
<th>Mean</th>
<th>Skills Passed</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2</td>
<td>38</td>
<td>19.00</td>
<td>6</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>7</td>
<td>7.00</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
<td>42</td>
<td>10.50</td>
<td>4</td>
</tr>
</tbody>
</table>

TABLE 9.—Blind girls versus partially seeing girls in A, B, C

<table>
<thead>
<tr>
<th>Plan</th>
<th>Skills Passed</th>
<th>Mean</th>
<th>Skills Passed</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>11</td>
<td>165</td>
<td>15.00</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>58</td>
<td>14.50</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>40</td>
<td>13.33</td>
<td>3</td>
</tr>
</tbody>
</table>
j. Blind boys versus blind girls in A, B, C

The difference in the number of children in each group influenced the mean performance ranking. Both the boys and girls showed a mean performance ranking preference for Plan A, instruction. The blind boys then selected Plan C, artificial aids and music, and Plan B, mind pictures and games; while the reverse was true for the blind girls. The blind girls selected Plan B, mind pictures and games; and Plan C, artificial aids and music. Mean performance for the blind girls was greater than the mean performance for blind boys in methods B and C.

<table>
<thead>
<tr>
<th>Plan</th>
<th>Blind Boys</th>
<th>Blind Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Skills</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No. Passed</td>
<td>Mean</td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>38</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
<td>42</td>
</tr>
</tbody>
</table>

k. Partially seeing boys versus partially seeing girls in A, B, C

The mean performance rankings of the partially seeing boys showed a preference for Plan C, artificial aids
and music; Plan A, instruction, and Plan B, mind pictures and games; while the mean performance rankings for the girls showed a preference for Plan A, instruction; Plan B, mind pictures and games; and Plan C, artificial aids and music. The numbers of children in each group differed, which might account for extreme differences in mean scores. In general, the mean performance of the partially seeing girls exceeded that of the partially seeing boys in Plan A and Plan B, but fell behind in Plan C.

<table>
<thead>
<tr>
<th>Plan</th>
<th>Partially Seeing Boys</th>
<th>Partially Seeing Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Skills Passed</td>
<td>Mean</td>
</tr>
<tr>
<td>A</td>
<td>6</td>
<td>73</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
<td>61</td>
</tr>
</tbody>
</table>

1. Blind girls in A, B, C

Blind girls showed a mean performance preference for Plan A, instruction; Plan B, mind pictures and games; and Plan C, artificial aids and music. Although there was a difference in the number of children in Plan A than
Plan B, and Plan C, the mean scores of the three methods were close.

**TABLE 12.—Blind girls in A, B, C**

<table>
<thead>
<tr>
<th>Plan</th>
<th>No.</th>
<th>Passed</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error of Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>11</td>
<td>165</td>
<td>15.00</td>
<td>4.30</td>
<td>1.36</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>58</td>
<td>14.50</td>
<td>6.41</td>
<td>3.70</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>40</td>
<td>13.33</td>
<td>5.86</td>
<td>4.16</td>
</tr>
</tbody>
</table>

**m. Partially seeing girls in A, B, C**

Partially seeing girls selected Plan A, instruction; Plan B, mind pictures and games; and Plan C, artificial aids and music. There were an equal number of children in Plans B and C. From this data one would assume that Plan B, mind pictures and games, held a definite preference ranking over Plan C, artificial aids and music.

**TABLE 13.—Partially seeing girls in A, B, C**

<table>
<thead>
<tr>
<th>Plan</th>
<th>No.</th>
<th>Passed</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error of Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2</td>
<td>40</td>
<td>20.00</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>43</td>
<td>14.33</td>
<td>6.03</td>
<td>4.28</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>34</td>
<td>11.33</td>
<td>7.23</td>
<td>5.13</td>
</tr>
</tbody>
</table>
Blind boys showed a mean performance preference ranking for Plan A, instruction; Plan C, artificial aids; and Plan B, mind pictures and games. The number of children per plan differed, and thus may account for discrepancies in the data.

TABLE 14.—Blind boys in A, B, C

<table>
<thead>
<tr>
<th>Plan</th>
<th>No.</th>
<th>Skills Passed</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2</td>
<td>38</td>
<td>19.00</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>7</td>
<td>7.00</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
<td>42</td>
<td>10.50</td>
</tr>
</tbody>
</table>

Partially seeing boys showed a preference for Plan C, artificial aids and music; Plan A, instruction; and Plan B, mind pictures and games.

TABLE 15.—Partially seeing boys in A, B, C

<table>
<thead>
<tr>
<th>Plan</th>
<th>No.</th>
<th>Skills Passed</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>6</td>
<td>73</td>
<td>12.16</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>5</td>
<td>5.00</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
<td>61</td>
<td>15.25</td>
</tr>
</tbody>
</table>
Additional data:

The skill performance of the forty-four handicapped children in the experimental instructional swimming program comprised the basis for the evaluation of individual, group and method accomplishments.

A mean score was developed for each group and each method.

In summary, the mean score findings showed the following results for the three methods: Plan A, instruction; Plan B, mind pictures and games; and Plan C, artificial aids and music.

1. Method

In the over-all method or plan of teaching the mean performance showed a ranking for Plan A, Plan C and third, Plan B.

2. Performance and Visual Acuity

The actual difference in mean scores showed that the twenty-five totally blind children passed three hundred and fifty skills, with a mean of 14.00 skills; and the nineteen partially seeing children passed two hundred and fifty-six skills, with a mean of 13.47 skills. The difference between the two groups was not statistically significant (t = .31).
The observed difference showed a slight mean score advantage for the totally blind child. Hayes supported this finding when he noted that with a little vision a child is often unwilling to rely on touch and there is a dissipation of effort.

TABLE 16.—Performance and visual acuity

<table>
<thead>
<tr>
<th>No. of Children</th>
<th>Skills Passed</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error of Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind</td>
<td>25</td>
<td>350</td>
<td>14.00</td>
<td>5.35</td>
</tr>
<tr>
<td>Partially Seeing</td>
<td>19</td>
<td>256</td>
<td>13.47</td>
<td>5.50</td>
</tr>
</tbody>
</table>

In regard to performance and visual acuity it was shown that in the total performance of the blind compared with partially seeing groups the blind preferred Plan A, Plan B and Plan C, while the partially seeing showed mean performance scores for Plan A, Plan C, and Plan B.

The difference in selection might well be attributed to opportunity to observe aids and the limited ability to measure progress or distances covered.

106 Samuel Perkins Hayes, Contributions to a Psychology of Blindness (New York: American Foundation for the Blind, Inc.), 1941, p. 82.
In addition to the total score performance of the blind and the partially seeing, the amount of vision within the sex groupings was determined. When the mean scores for the blind boys were compared with the mean scores of the partially seeing boys it was found that Plan A, Plan C, and Plan B were ranked for the blind boys while Plan C, Plan A, and Plan B were the rankings for the partially seeing boys.

The same type of survey was made for the blind and partially seeing girls, and no similarity was found to the pattern of the boys of equal vision. The girls of both groups showed a mean score ranking for Plan A, Plan B, and Plan C.

3. Performance and Sex Differences

Twenty-six girls and eighteen boys were in the experimental instructional program. The girls passed a total of three hundred and eighty skills, with a mean score of 14.62 skills. The boys passed two hundred and twenty-six skills, with a mean score of 12.56 skills. The statistical analysis showed the data non-significant (t = 1.24).

The findings of this study are interesting, since they do not follow the results found by Buell in one phase of his study of motor performance - a finding which showed
that boys with defective vision perform relatively better than do girls. 107

TABLE 17.—Performance and sex differences

<table>
<thead>
<tr>
<th>No. of Children</th>
<th>Skills Passed</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error of Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls</td>
<td>26</td>
<td>380</td>
<td>14.62</td>
<td>5.43</td>
</tr>
<tr>
<td>Boys</td>
<td>18</td>
<td>226</td>
<td>12.56</td>
<td>5.16</td>
</tr>
</tbody>
</table>

The boys in the total experimental group showed a mean score ranking for Plan A, Plan C, and Plan B; while the girls in the total experimental program followed a ranking for Plan A, Plan B, and Plan C.

It was shown that the blind boys and the blind girls showed a high mean performance score for Plan A. Differences among the blind boys and the blind girls were shown in Plans B and C. The blind boys had a mean score preference ranking for Plan C and Plan B as opposed to the Plan B and Plan C ranking for the girls.

Mean score rankings were made for the partially seeing boys and girls, and a different trend appeared. The

partially seeing girls showed a mean score ranking for Plan A, Plan B, and Plan C; while the partially seeing boys showed a mean score ranking for Plan C, Plan A, and Plan B.

Considering the performance of the girls and the performance of the boys, it was shown that both the blind and partially seeing girls had a mean performance ranking for Plan A, Plan B, and Plan C. There were differences found among the blind boys and the partially seeing boys. The blind showed a mean performance ranking of Plan A, Plan C, and Plan B; while the partially seeing mean performance ranking showed Plan C, Plan A, and Plan B.

4. Performance and Age

The mean age of the total experimental group was eight years. The ages ranged from six years, ten months to twelve years, three months.

The mean score performance of the 7-year-old group was 15.22, while the mean score performance of the 8-year-old and 9-year-old children was 13.33 and 12.82, respectively. Thus, the assumption that the older child might do better than the younger child did not hold true.

Statistical analysis of the relation of age to performance did not reveal any significant findings, and little
TABLE 18.—Performance and age for blind and partially seeing boys and girls

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of Children Blind</th>
<th>Partially Seeing Boys</th>
<th>Girls</th>
<th>Skills Passed</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error of the Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>22</td>
<td>11.00</td>
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<tr>
<td>7</td>
<td>9</td>
<td>7</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>137</td>
<td>15.22</td>
</tr>
<tr>
<td>8</td>
<td>15</td>
<td>9</td>
<td>6</td>
<td>5</td>
<td>10</td>
<td>200</td>
<td>13.33</td>
</tr>
<tr>
<td>9</td>
<td>11</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>141</td>
<td>12.82</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>88</td>
<td>14.67</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>18</td>
<td>18.00</td>
</tr>
</tbody>
</table>
supportive evidence is found in literature. Buell noted that if vision were lost after the child was six years of age, he would not have as much difficulty in adjusting to physical activity as the child blind from early childhood.\textsuperscript{108}

Additional factors which must be considered in relation to age and performance are the environmental factors and experiences of the child, his peer, community, family relationships, the amount of useful vision and the extent of use and the duration of the visual handicap. Buell listed many of these factors as those which may affect the motor performance of the visually handicapped child.\textsuperscript{109}

5. Performance and General Ability (I.Q.)

The policy of the Ohio State School for the Blind did not permit the writer to learn the exact I.Q. scores of the children. A code system was made available:

<table>
<thead>
<tr>
<th>I.Q. Score</th>
<th>Code Figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>110+</td>
<td>A</td>
</tr>
<tr>
<td>100-109</td>
<td>B</td>
</tr>
<tr>
<td>90-99</td>
<td>C</td>
</tr>
<tr>
<td>89-79</td>
<td>D</td>
</tr>
<tr>
<td>78--</td>
<td>E</td>
</tr>
</tbody>
</table>

\textsuperscript{108} Charles E. Buell, Vol. XVII, op. cit., p. 69.

\textsuperscript{109} Ibid., p. 72.
The findings of performance as they related to general ability did not show the pattern the writer assumed would develop, that is, the lower the I.Q., the greater the decrease in performance. On the contrary, as the I.Q. decreased below code C, the mean score performance for the boys increased. This pattern was more evident for the boys in the experimental program. It is of interest to note the large number of children in the code A group (see Table 19).

Because of the nature of the testing procedures, the ages of the children, the environmental setting, and the types of tests to measure I.Q. one must use caution in making generalizations about the intelligence of the blind compared with that of "normal" seeing children.

Studies have shown several factors about the intelligence of the blind.

Pintner et al. stated that "...the median attainment of the blind stands somewhat below that for the seeing."\textsuperscript{110} He noted further that, "The median I.Q. is probably a little below 100."\textsuperscript{111} Hunt stated, "The median I.Q. of blind people is only slightly lower than that of

\textsuperscript{110}Rudolf Pintner, Jon Eisenson and Mildred Stanton, \textit{op. cit.}, p. 213.

\textsuperscript{111}Ibid., p. 219.
TABLE 19.—Performance and general ability (I.Q.)

<table>
<thead>
<tr>
<th>I.Q. Grouping</th>
<th>No. of Children</th>
<th>Skills Passed</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>12</td>
<td>179</td>
<td>14.91</td>
</tr>
<tr>
<td>B</td>
<td>9</td>
<td>123</td>
<td>13.66</td>
</tr>
<tr>
<td>C</td>
<td>12</td>
<td>145</td>
<td>12.08</td>
</tr>
<tr>
<td>D</td>
<td>6</td>
<td>89</td>
<td>14.83</td>
</tr>
<tr>
<td>E</td>
<td>5</td>
<td>70</td>
<td>14.00</td>
</tr>
</tbody>
</table>

<p>| | | | |</p>
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<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
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<td>137</td>
<td>15.22</td>
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<tr>
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</tr>
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<td>E</td>
<td>4</td>
<td>52</td>
<td>13.00</td>
</tr>
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</table>

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>3</td>
<td>42</td>
<td>14.00</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>34</td>
<td>11.33</td>
</tr>
<tr>
<td>C</td>
<td>5</td>
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<td>8.60</td>
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<tr>
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<td>89</td>
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</tr>
<tr>
<td>E</td>
<td>1</td>
<td>18</td>
<td>18.00</td>
</tr>
</tbody>
</table>
normal people; the difference is probably related to central nerve destruction, which causes much blindness.\textsuperscript{112}

According to Lowenfeld,

The percentage of blind pupils falling into the 'average group' is somewhat smaller than 50 per cent for the seeing. A slightly larger percentage of superior pupils is found among the blind and a considerably larger percentage below average pupils.\textsuperscript{113}

Pintner supported this finding when he noted "The percentage of high I.Q.'s probably differs but little from that found among the seeing. The greatest difference would seem to lie in the excessive number of low I.Q.'s among the blind."\textsuperscript{114}

The writer found no correlation for performance and general ability (I.Q.). Statistical data did not show any significance between I.Q. levels and performance or I.Q. and extremes in the performance scores and great evidences of individual differences.

Hunt noted "...in spite of native capacities blind people display individual differences in motivation--some

\textsuperscript{112}Valerie Hunt, \textit{op. cit.}, p. 76.


\textsuperscript{114}Rudolf Pintner, \textit{loc. cit.}. 
are challenged to great accomplishment; others are almost helpless."115

V. Achievements, Admonitions and Adaptations

The results of the study showed common patterns or trends while at the same time actual differences were made evident for performance and visual acuity, performance and sex differences and performance and method.

Individual differences were shown, differences which would be common among any group of youngsters, sighted or not. According to Oberteuffer,

Children perform differently, learn at different rates of speed, are different in their coordinations, grow at different rates, and thus make any average or norm merely a guide and not a definite standard to go by in the development of any given child.116

Thus it can be seen that, "All learning, motor or otherwise, is expressed in a pattern for each varying individual, and it is not reasonable to expect, therefore, that a whole class will progress together and equally in the mastery of any sport."117

115 Valerie V. Hunt, op. cit., p. 76.
116 Delbert Oberteuffer, op. cit., p. 103.
117 Ibid., p. 251.
Throughout the experimental program, the writer noted the achievements of the blind and partially seeing children, and the difficulties they experienced in learning some of the skills.

Admonitions and adaptations differed in regard to the individual, the stroke learned, the method used and the teaching personnel; but nevertheless a few common beliefs, or trends, seemed to emerge from this experimental unit—beliefs which may be common to the forty-four children of the experimental unit but at the same time have some implication to the learning process and technique to be employed with other visually handicapped youngsters.

**Preliminary swimming activity.**—The dressing and showering was a new experience. Many of the children had not dressed or undressed by themselves and although the procedure often was slow they seemed to enjoy "surprising" their swimming teacher. For many showers were new and, like all children, they seemed to enjoy the water dripping overhead, and taking in a mouth full, etc.

The children followed a general routine each time they prepared for swimming. Within a week they knew where their lockers were, where the showers were and how to
get to the pool area and find their swimming area and teacher.

The children were carefully supervised, although the life guards, teachers, and general helpers were instructed to let the children become "independent."

Physical and mental adjustment to the water was made quite rapidly. The "tour" around the pool was an important part of the program. The tour was of three parts: first, the outside area of the pool was explored, the ladders, steps and diving board area were located. The three or four teaching stations were noted. Second, the exploration of the instructional area was made: the width of the pool, the roped-off areas, the water inlets, the distance from the water's edge to the top of the deck, the tables and their location in the pool. Third, the total pool area was explored by means of an overhand "tour" around the inside of the pool. Supervision was highly maintained and groups were permitted to travel only with their instructor. No more than three children were allowed to "travel or take a tour" at one time. The writer found the children most interested in the "tour." Since the tour was not forced upon the child, and since the supervision and safety factors were strictly followed there was no fear on the part
of the children. They seemed to accept the "tour" as part of their orientation to the surroundings. The gradual drop or slope of the pool bottom and the associated "safety" learnings (the float, if in trouble, or the dog paddle and float) seemed to give the children a feeling of assurance in this area, while it provided the instructor with an opportunity for associated learnings.

Breath-holding and bubbles were accomplished without much difficulty, although there were extremes in performance and great ranges of individual differences.

The children seemed to have difficulty in learning the proper leg kick. Their kicking did not originate as a natural swing from the hip but was rather a bend and extension from the knee. The range of movement was abducted away from the axis of the body. The kick was similar to the action employed in climbing stairs or walking astride a rocky ditch. After drill, the movement came closer to the midline of the body, but the problem of knee bend and extensive knee action was not greatly reduced. (See Figures 21 and 22, page 126.)

The leg kick was taught, showing the relationship of both legs. This differed from the drill on one leg at
Fig. 21.—The flutter kick with exaggerated knee bend.

Fig. 22.—Practicing the flutter kick. Note inverted kickboard.
a time approach used by Belenky. After viewing this type of progression and its teaching problems, the writer, with reference to previous experiences in teaching children, felt it best to consider the kick as a whole and to develop a pattern or awareness for a symmetrical, rhythmical pattern. Thus, it was felt the spatial relationships and kinesthetic sensations might be developed more rapidly.

As Belenky noted, most of the children could not learn the kick from just a verbal description. Demonstration, a kick by the teacher and movement of the child's feet and legs, was effectively used. (Figures 24 and 25.)

Balance seemed to be one of the basic factors when using the kickboard. The writer noted a trend for the blind child to hold the board in a somewhat unorthodox manner. The curve of the board was placed toward the body; the square end away from the body. (See Figure 20.)

![Fig. 23.—The use of the kickboard.](image)

---

Fig. 24.—The instructor moves the child's feet to develop a kinesthetic awareness for the flutter kick.

Fig. 25.—The children "watch" the teacher kick.
In the light of the writer's attempt to "experience" this method it seems quite logical and does seem to add a little additional support.

The introduction of the kickboard was preceded by a gradual amount of assistance until individual confidence was developed. The ability to utilize effectively the kickboard developed rapidly. Many children learned to kick and then use the board without assistance in one lesson.

**Buoyancy, body position and relaxation.**—In learning the face float, the back float and the jelly fish float assistance was necessary.

Water flowing in the ears was the greatest problem in teaching the back float. Many of the children did not wish to have their head and ears in the water. Some said it "scared" them; others expressed the fact that the water "tickles."

Recovery to a stand was somewhat of a problem as a kinesthetic orientation was necessary. On the prone float the difficulty was in getting the hips under; with the back float the problem, similar to that of all beginners, was the throwing of the head backward instead of tucking the chin and bringing the head forward.
The arm position was confusing to many, but the children soon learned that lifting the arms out of the water would make them sink. With drill, the skill was mastered by most of the children and they seemed to develop quite a bit of confidence and pride in their ability to float. Many were motivated to float, liked it best, and wanted the teacher to count "how long they could float on their back." Progress in this skill was rapid. One child progressed from a count of thirty to one hundred and ten in one session. The children had to learn the proper breathing techniques on the back float in order to be allowed to float over a count of forty. A factor holding back performance on this skill was "satisfaction" or "accomplishment." The children often were so pleased with their progress that they would laugh, lose air, and body position, then sink!

The jelly fish float was not mastered with much enthusiasm (see Figure 28). The lack of interest may be attributed to the stationary position or the "cutting off" of the surroundings when the children placed the head under water.

The rhythmic breathing was enjoyed by many although few drilled the skill without holding the nose. Children in Plan C enjoyed this skill because they could hear the music
underwater. The writer believes the motivation of going under was much greater for this group. Also there was less comment of water in the ears.

**Propulsive movement, changing position.**—The children learned these skills quite rapidly after some initial support and assistance from the instructor. The greatest difficulty in performance came in ascertaining direction of movement. In order to facilitate the learning process, strokes or skills were mildly adapted to a change in body position. The head was slightly raised in order to enable the ear level to be above the water. In skills such as finning, the child was encouraged to take small continued strokes with a slight flutter kick rather than large forceful arm strokes which would place the head in position for a good bump.

The "dog paddle" was taught chiefly as a safety device. The chief problem in learning this underwater stroking skill was that of coordination and balance. The blind and the partially seeing children often pulled with both arms at the same time, recovered with one or both arms above the water or reversed the circular stroking action of the arms. In teaching this skill it often was necessary for the teacher to move the child's hands. The writer
observed that the children comprehended the fundamentals of the skill faster when the teacher stood behind the pupil and moved his arms. It was observed that standing in front of the child inhibited arm movement and quite often caused him to reverse the pull or power of the stroke. (See Figure 26.)

After the fundamentals of glide and kick and the elementary strokes of finning and the dog paddle were mastered, the child moved to the next area— that of coordinated stroking.

Coordinated stroking.—While it is true that the head in the water lessens the child's contact with the environment and the teacher, the writer believes that the elimination of such skills as the front crawl and the back crawl to the inclusion of strokes like the side stroke and the trudgeon cannot be justified for the child's aquatic development and his needs for social acceptance. The latter skills, furthermore, are quite difficult for the average young child to master and are not, in this decade, the skills first learned by his peers.

Rather than eliminate the crawl stroke from the swimming repertoire of the visually handicapped, the writer believes slight adaptations should be made in body position
Fig. 26.—The instructor teaches the basic arm movements for the "dog paddle" and the crawl stroke.

Fig. 27.—The instructor claps the direction as children attempt to swim a short distance.
to facilitate hearing and in arm movement to provide an extension for safety.

Throughout the coordinated stroking phase, several patterns appeared and several admonitions assisted in the teaching of the skill.

In the elementary back stroke the arm movement was taught, first enabling the youngster to learn the skill quite rapidly and successfully. The verbal instruction most appropriate was to stress "arms slide up the side of the body and circle around back to the side." All teachers eliminated the often "traditional" up-out-together approach in teaching. Previous experience with blind youngsters showed the "out" phase to be too forced or stiff and the "together" phase often misinterpreted to mean "overhead together," or a "together pull across the top of the body."

The flutter kick was used with the stroke until the arm coordination became quite natural.

The writer was amazed with the kinesthetic awareness of several children in performing this stroke, and even more surprised with the ease and high degree of comprehension in learning the kick and the stroke coordination. For one child, the instruction of the leg kick consisted merely of telling her to turn her knees out as she brought
her feet up and circled them around and together again. The writer mentioned the total coordination "start arms, then feet, circle both and float glide," and the child eagerly bounced off to try - completing a width, two widths and then a length, non-stop (20 yards) on her "solo attempt." (See Figure 29.)

Coordination of the front crawl stroke approximated many of the problems common with the learning of the dog paddle. That is, a double arm pull, and reversed arm stroking. Body position fluctuated, several children holding their heads low and their feet high; others holding their heads high and dropping of their feet. Arm placement differed from that of the average beginner in that the spatial relationships were vague and contributed to the placement of the arms at a 45 degree angle from the midline.

The arm pull, common with that of most beginners, often was irregular, and breathing coordination was difficult to master.

Change of positions was learned rapidly. The turn from the back to the front was learned with greater ease than the turn from the front to the back. The placement of the arms and the head caused the most difficulty. Admonitions utilized in the teaching of the skill included
Fig. 28.—The jelly fish float.

Fig. 29.—The elementary back stroke.
continued advice about head position, with a leg roll emphasized on the back to front turn, and a shoulder roll emphasized on the front to back turn.

Change of direction and general swimming direction were facilitated by auditory signals, the instructor clapping her hands or calling encouragement. (See Figure 27.)

Levelling off and treading water were taught as part of combined strokes. For the treading skill emphasis was placed upon arm action—the push down-slide back; and the leg kick, which was similar to the elementary back-stroke kick. In order to provide the swimmer with more security the divisional guide ropes were crossed enabling him to brace himself and practice the skill. (See Figure 30.)

\[
\begin{array}{c}
\text{deep} \\
\hline
\text{Shallow} \\
\end{array}
\quad \xleftarrow{\text{guide ropes}} \quad
\end{array}
\]

Fig. 30.—Support for learning to tread water.

Methods of entering the water.—The jump from the edge of the pool eagerly was attempted by most of the youngsters. The writer observed a trend in the performance of
this skill common to many beginners and children of this same age. This trend was to jump "stomach" first. (See Figure 31.)

Learning to jump followed a continuous pattern of a jump from table, a sit jump to shallow water from the side, and a jump to shallow water with an instructor catch from the side. Jumping on the pool deck and a discussion of foot position and push preceded the final learning and jumping stage into water. Each child was encouraged to jump erect after making sure there were no swimmers or obstacles in his way. (See Figure 32.)

When a child mastered the basic safety skills of a "distance swim," the back float, treading and levelling off, he was allowed to jump into deep water. The writer found a little "harness" or "rope belt" gave the child confidence for the jump. This rope was held by one of the guards and the child jumped into the water to the instructor. (See Figure 33.)

Safety skills.—Personal safety and safety in small craft were stressed by all teachers in all methods. The child learned the basic fundamentals of "trimming" a canoe as well as the safety procedures in a submerged craft. (See Figures 34 and 35.)
Fig. 31.— The incorrect jump from the side.

Fig. 32.— The correct jump.

Fig. 33.— The "rope harness" gives the blind child confidence as he jumps from the diving board.
Fig. 34.—Safety in small craft.

Fig. 35.—Safety in a submerged canoe.
The learning of the back float with minimum propulsion was drilled as the one basic skill for each child.

The children were eager to pass and complete the skills. Due to the general interest and "motivational drive" of the children to complete skills, the writer believes it essential for the teacher of swimming to introduce and recheck the child's swimming ability and status before allowing him to venture to water over his head. Prerequisites to middle or deep water should be the ability to maintain the body above the surface for approximately 20 yards, the float for one or more minutes, the turn over and the tread.

**General teaching patterns and method considerations.**

—Demonstrations were an important part of the teaching program. Two types of demonstrations were employed in the experimental unit; the audible and the tactile. Audible approaches included the rhythmic claps, "drum" beats or the listening to the flutter kick or the breathing (bubble blowing). Tactile demonstrations were made by "seeing" the teacher or another member of the group perform the jelly fish float, or the flutter kick etc. This method also utilized the approach of the teacher moving the child's arms or legs in the desired pattern.
General direction and orientation was obtained by the clapping of hands and calling to the child (see Figure 27). As the children awaited their turns in swimming a distance they would clap for each other. Upon many occasions the children called the writer and clapped their hands so she could find them!

In regard to teaching progression and skills each child progressed at his or her own speed. An attempt was made to keep the program flexible while at the same time have it follow a similar progression pattern.

Learning rates had a wide range and many individual differences in learning were evident.

Repetition or review of lessons and skills was made an important phase of the program. (See lesson outline, Appendix A.)

In addition to the instructional swimming unit, the program endeavored to provide opportunities for associated learnings and experiences through the gymnasium or "free-game" period. This program preceded or followed the swimming instruction depending on the child's classification - "whale" or "fish."
Plan B - mind pictures and games.—Belenky noted that many of the informal activities and games, although attributed to the first swimming periods, might require more than one period.\footnote{120} The writer found this quite true. Many games developed from the child's experiences at school. Some games were disregarded the first time they were presented and later were accepted as "fun." An example of this was the "face wash" or the "soapy sox rinse" and the "motor boat." After repeated attempts and successful endeavors the children often requested "as a favorite or special last part of the lesson" some pre-learned skill game. The "little bird, come" was one of the most popular games, since it allowed the child to progress and swim a little farther with each attempt.

Plan C - artificial aids and music.—The fins and life jackets were not approached with too much enthusiasm in the early stages of the instructional program. They were made available and were "placed" near the groups in order that the children might examine them, adjust to them, and "trust" their function.

\footnote{120 Robert Belenky, \textit{op. cit.}, p. 11.}
The writer found it helpful to encourage the children in the use of the aids while at the same time help them maintain assistance or support; pulling the child in a prone flutter kick and reassuring him on the recovery to a standing position when he wore the flippers was important. The child had to readjust to the kinesthetic sensations of balance attributed to fin wearing and life jacket use.

One important factor in the use of aids was the purchase and size for children. The life jackets were of two sizes; one, for children weighing 50 pounds and under; the other for children weighing 45 to 90 pounds. The fins were small and were of a very flexible rubber which allowed for comfort and ease in swimming as well as simplicity in putting them on or taking them off.
CHAPTER VI

SUMMARY AND CONCLUSIONS

The lack of sight places some restriction on a person's mobility, his physical development, and his social contacts. The limitations imposed upon the individual need not, however, hinder all opportunity for the development of persons, and their social and physical growth through the participation in activities.

The blind individual benefits from physical activity because it provides him with a means of enjoying life, developing social behaviors and learning motor coordination commensurate with his peer group and with the society in which he finds himself. Sports and games can provide successful experiences and can often lead the individual to a wider range of activity. Lowenfeld stressed the value of sports when he said:

Activities which can be pursued by an individual independent of a group, as for example, swimming or bowling, should receive particular attention. They are the ones which will more likely be continued into adult life.\(^{121}\)


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Historically, the role of education and physical education in schools for the blind was traced, and the values of swimming were noted in terms of the bearing it has on recreational, psychological, physical and social adjustment for the visually handicapped.

The experimental program was planned with the teaching units, Plan A, instruction; Plan B, mind pictures and games; Plan C, artificial aids and music. The forty-four children of the program were classified in relation to visual acuity, sex, age, and interest-ability. The fourteen lessons were on an individual basis under the direction of qualified personnel.

The evaluation of the child's progress was made from the performance of the twenty basic skills which were subdivided into preliminary skills, elementary skills, floating skills, swimming skills, and safety skills. Over-all performance was evaluated within three areas: (1) basic skills, (2) swimming skills, and (3) safety skills.

The findings of the experimental unit showed differences in performance for the blind and the partially seeing, as well as slight sex differences or preferences. Age and I.Q. also were investigated. The mean performance of the
blind was better than that of the partially seeing, with the blind showing a preference for methods A, B, and C, and the partially seeing preferring A, C, and B.

Sex differences showed the boys' preference ranking for A, C, B and the girls' for A, B, C. There seemed to be a consistent A, B, C pattern for both the blind and the partially seeing girls; while differences appeared for the blind and partially seeing boys. The blind boys had a mean score ranking for A, C, B, while the partially seeing had a mean score ranking for method C, A, B.

Actual or mean scores showed differences in performance; however, the statistical analysis did not significantly show any extremes for method and/or performance.

The results of the study, in addition to method selection and performance skills, showed that the visually handicapped child can learn to swim and that he can equal the performance of his seeing peers in many of the basic swimming and safety skills. Skills for the visually handicapped should include both the easily mastered and the difficult areas; methods of teaching should vary with the child's physical condition, needs, interests and environmental surroundings.

Each method has a contribution to make in the teaching of swimming. "Pure" instruction, while it is of value...
for some, may not be the best for another. The writer feels the game and mind pictures approach as well as the artificial aid and music approach has extensive worth in the teaching of swimming to the blind.

The findings of this study should be supported by additional research which would include a greater number of children in a large geographical area.

The observations of this study, then, might be a foundation for further programs, while at the same time the observed results may assist the parent, the teachers and the community in providing swimming opportunity and instruction to the visually handicapped.

The blind and partially sighted can learn to swim and should be provided with an opportunity to acquire personal safety aquatic experiences, for,

They learn to walk, to talk, to feed themselves, and to play just like all other children. It may take them a little longer to acquire skill in one or the other activity, but with patient understanding and consistent guidance they will succeed.122

APPENDIX A

LESSON OUTLINE
APPENDIX A

LESSON OUTLINE

The lessons were organized so that a general plan might be followed by all groups. Within the plan there was a need for flexibility due to individual differences

Area I   - Physical and mental adjustment to the water
Area II  - Buoyancy, body position and relaxation
Area III - Propulsive movement, changing position
Area IV  - Coordinated stroking
Area V   - Methods of entering the water
Area VI  - Safety skills

Lesson Plan Outline

1st week -
Lesson 1. Area I. Orientation to pool area
Lesson 2. Areas I and II

2nd week -
Lesson 3. Area II
Lesson 4. Area II

3rd week -
Lesson 5. Area III
Lesson 6. Area III

4th week -
Lesson 7. Review II, III
Lesson 8. Area IV

5th week -
Lesson 9. Area IV
Lesson 10. Area IV

6th week -
Lesson 11. Area IV
Lesson 12. Review II, III, IV. Skill testing

7th week -
Lesson 13. Area V. Skill testing
Lesson 14. Areas V, VI. Skill testing
APPENDIX B

SKILLS OF THE TESTING UNIT
APPENDIX B

SKILLS OF THE TESTING UNIT

1. **Dress and shower**
   
   Child undress, get into bathing suit without assistance; walk to shower and to pool area.

2. **Sit on the side of the pool and kick feet in the water**
   
   Sit on the edge of pool, in class position; kick feet and splash.

3. **Sit on the table (shallow water) and splash water over yourself**
   
   Slide from side to table and splash self.

4. **Slide from the table and touch the bottom of the pool with toes**
   
   Unassisted slide from table and touch bottom of pool.

5. **Put face in water**
   
   Water must be over the eye level.

6. *With face in the water, hold your breath to the count of ten (breath-holding)*
   
   a. face fully submerged
   b. breath held 10 seconds

7. *Blow bubbles - rhythmic breathing)*
   
   a. chest deep water
   b. alternate inhale and exhale 10 times rhythmically and continuously
8. **Hold side and kick - 20 kicks**
   Hold gutter, support self and kick feet.

9. **Jelly fish float and stand**
   Unassisted float and stand.

10. **Face float and stand**
    a. waist deep water
    b. float and stand without assistance.

11. **Back float and stand**
    a. waist deep water
    b. hold position with face above the water for at least 10 seconds
    c. return to standing position unaided.

12. **Elementary stroke** (combined stroke on back)
    a. waist deep water
    b. back glide
    c. finning or elementary back arm
    d. flutter kick
    e. swim a minimum of 10 yards.

13. **Front glide and kick**
    a. waist deep water
    b. front float position and glide a distance of at least two body lengths
    c. kick and glide another two body lengths
    d. resume standing position unaided.

14. **Back glide and kick**
    a. waist deep water
    b. push off and glide a distance of at least one body length
    c. kick and glide another body length
    d. resume standing position.
15. *"Dog paddle" or "human stroke"
   a. waist deep water
   b. prone position (on stomach)
   c. legs trail or kick gently
   d. use arms to pull, recover arms under water, and
      make progress
   e. swim a minimum of 10 yards.

16. *Crawl stroke* (combined stroke on front)
   a. water of standing depth
   b. swim a minimum of 10 yards using elementary
      crawl or dog paddle.

17. *Turn over*
   a. swim on front, roll to back, float motionless
      or continue swimming
   b. turn back to front
   c. *also include change of direction.

18. *Level off*
   a. neck deep water
   b. push off bottom and swim
   c. may be done with a jump.

19. *Jump from the side into shallow water*
   a. jump from side, push off and glide
   b. swim to safety.

20. *Safety tests*
   a. knowledge
   b. swimming - combined skills
   c. small craft.

*ARC skill recommendation.
APPENDIX C

SKILLS PASSED
## APPENDIX C

**SKILLS PASSED**

<table>
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<th>Skill</th>
<th>Number (44 Children)</th>
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APPENDIX D

AREA SKILLS
### APPENDIX D

#### AREA SKILLS

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<td>11 - Back float and stand</td>
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APPENDIX E

METHOD, VISUAL ACUITY, SEX AND PERFORMANCE
### APPENDIX E

**METHOD, VISUAL ACUITY, SEX AND PERFORMANCE**

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APPENDIX F

PERFORMANCE AND ITS RELATIONSHIP TO SEX OF THE PARTICIPANTS
APPENDIX F

PERFORMANCE AND ITS RELATIONSHIP TO SEX OF THE PARTICIPANTS

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APPENDIX G

AGE, SIGHT AND PERFORMANCE
# APPENDIX G

## AGE, SIGHT AND PERFORMANCE

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APPENDIX H

GENERAL ABILITY (I.Q.) AND PERFORMANCE
### APPENDIX H

**GENERAL ABILITY (I.Q.) AND PERFORMANCE**

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APPENDIX I

SWIMMING QUESTIONNAIRE - 1959
APPENDIX I

SWIMMING QUESTIONNAIRE - 1959

Child's name_________________

Swimming group___________ Instructor_________________

Directions: It is recommended that each instructor have a personal chat with each child. Attempt to determine the child's reactions to the questions; do not "push" for any answers.

1. Did you like this swimming program? Yes 44; No 0.

2. What did you like best? Skills most often selected were: kicking, floating, crawl, dog paddle, elementary back stroke and the jump.

3. Is there anything you did not like? Skills mentioned were: back float, jelly fish float, rolling over, and the splashings of other children.

4. Will you be able to go swimming this summer? Yes 28; No 10; Undecided 6.

5. Will your family go to a lake 12, ocean 0, pool 17?

6. Can anyone in your family help you with your swimming? Yes 19; No 12; Undecided 7; No answer 6.

7. Is there anyone at the pool area in your neighborhood who will help you? Yes 10; No 16; Undecided 11.


10. If you have any brothers or sisters, do they swim? Yes 13; No 15.

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11. What swimming skills do you think you do best? The back float, crawl, dog paddle and elementary back stroke were those most frequently selected.

12. What swimming skills do you think you need to practice? Crawl, dog paddle, floats, elementary back stroke and breathing.

Safety knowledges

13. When you are swimming and get tired what should you do? (Correct answer should be: float or change to a resting stroke.)

Correct answer 16
Incorrect answer 22
No answer 6

14. What should you remember about new swimming areas, lakes, etc. (Correct answer should be: swim in supervised areas; do not swim alone; know the swimming area - know where boards, docks, rocks, etc are located.)

Correct answer 20
Incorrect answer 18
No answer 6
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BIBLIOGRAPHY

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Unpublished Material

The American National Red Cross, Akron Chapter, Summit County Planned Program of Swimming for Handicapped. February 27, 1959. (Notes and mimeographed material.)

The American National Red Cross, Chicago Chapter. "Planned Program in Aquatics for the Handicapped and Disabled." (Mimeographed.)


Other Sources


I, Jean Grutzmacher, was born in San Francisco, California, September 4, 1930. My elementary and secondary education was received through the public school system of San Francisco. I received my undergraduate training at the University of California, Berkeley, which granted me the Associate of Arts degree in 1951, and the Bachelor of Arts degree in 1953. I attended graduate school at the University of California one semester prior to my enrollment as a graduate student at The Ohio State University, where I accepted a Graduate Assistantship with the Department of Physical Education for Women. I received the Master of Arts degree from The Ohio State University in 1954.

My teaching experience, in addition to the year as a Graduate Assistant, includes two years, 1954 to 1956, at Purdue University, and four years at The Ohio State University, 1956 to 1960, where I taught in the Department of Physical Education for Women and completed the requirements for the degree Doctor of Philosophy.
My swimming experiences in local, Far Western, National, and International championships during the years 1946 to 1951, and volunteer work with the American National Red Cross and community groups helped develop an interest in the teaching of swimming to children and adults, particularly handicapped persons. Teaching experience with the handicapped includes work at the University of California during my undergraduate years, and the development of teaching in a swimming program for blind and partially seeing children from the Ohio State School for the Blind during the years 1953 to 1954 and 1956 to 1960. In December, 1959 I received the Hazel Wilbraham Research Grant of The Women's National Aquatic Forum.