1-1-1972

Review of the literature regarding brain injury; its relation to education

Dianne Siegel

Follow this and additional works at: https://digitalcommons.stritch.edu/etd

Part of the Education Commons

Recommended Citation
https://digitalcommons.stritch.edu/etd/665

This Research Paper is brought to you for free and open access by Stritch Shares. It has been accepted for inclusion in Master's Theses, Capstones, and Projects by an authorized administrator of Stritch Shares. For more information, please contact smbagley@stritch.edu.
A REVIEW OF THE LITERATURE REGARDING BRAIN INJURY; ITS RELATION TO EDUCATION

CARDINAL STRITCH COLLEGE LIBRARY
Milwaukee, Wisconsin

by
Dianne Siegel

A RESEARCH PAPER SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN EDUCATION (EDUCATION OF MENTALLY HANDICAPPED) AT THE CARDINAL STRITCH COLLEGE

Milwaukee, Wisconsin
1972
## CONTENTS

### CHAPTER I.

- Introduction ............................................. 1
- Purpose .................................................. 4
- Definition of Terms ....................................... 4
- Limitation of Problem .................................... 5

### CHAPTER II.

- Review of Literature ...................................... 6
- Identifying the Brain Injured ............................ 15
- Educating the Brain Injured ............................. 17
- Teachers of the Brain Injured ........................... 30
- Parents of the Brain Injured ............................ 31
- Summary .................................................. 34

### CHAPTER III.

- Conclusions ............................................. 36
- Implications ............................................. 36

### BIBLIOGRAPHY ............................................ 39
This research paper has been approved for the Graduate Committee of the Cardinal Stritch College by

[Signature]
(Advisor)

Date [May 1973]
CHAPTER I

Introduction

Throughout the past years many persons introduced theories regarding brain injury. Their formulation of ideas ranged from simple to complex. It was obvious that the brain injured individual was not new in our world. Only his identification as such was fairly recent. This was the child whose behavior was due to a "fall on the head" or the child who was known as the "odd one." The term "brain injured" was a very nonspecific term which related no definite concepts. Many recognized the symptoms and regarded them as brain damage with conceptual or behavioral handicaps. Although there were many titles used to describe brain injury, such as minimal brain dysfunction, there was general agreement that abnormal behavior was the outstanding symptom. It had also been surmised that this behavior appeared early in life and was derived from a neurological defect. It had been thought that these disturbances were not related to environmental or interpersonal factors.

It is important for this introduction to include a clinical definition of the brain injured child. Strauss, a pioneer in this field stated:

A brain injured child is a child who before, during, or after birth has received an injury to or suffered an infection of the brain. As a result of such organic impairment, defects of the neuromotor system may be present or absent; however, such a child may show disturbances in perception, thinking and emotional behavior, either separately or in combination. These disturbances can be demonstrated by
specific tests. These disturbances prevent or impede a normal learning process.\(^1\)

Clements defined minimal brain dysfunction in the following way:

The diagnostic categories subsumed under the rubric of minimal brain dysfunction refer to children of average or above general intelligence with learning and/or behavior difficulties ranging from mild to most severe which are due to subtle deviations arising from genetic variations, bio-chemical irregularities, perinatal brain insults, and/or illness and injuries sustained during the years critical for the development and maturation of those parts of the central nervous system having to do with perception, language, inhibition of impulses and motor control.\(^2\)

In summary it could be said that the brain injured child deviated from the normal child in such a way that his behavior tended to be nonconforming and unpredictable. His development appeared to be erratic. He might not, in progressing from one age group to another, achieve the levels of performance which characterized normal growth. This child was other than normal due to accidental damage to his brain. The phenomenon which caused this might have taken place before, during or after birth. The child could or could not have been physically handicapped due to the location of the brain damage.

The brain injured child would often have normal parents. This type of injury was found in every group of society and at every time in history. Brain injured individuals were found not only among the children of those in lowly occupations but among the children of musicians, doctors, teachers and ministers. Typically, the child began life in his mother's womb with a normal brain potential. His regular development was disrupted by an accident. The brain injured child was not easy to classify.


He could but need not be mentally defective, have motor disturbances, language problems, spatial relationship problems, hyperkinetic behavior, digestive disturbances or seizures. Sometimes the brain injured child was not detected early in life if he was not physically handicapped. He might appear normal at times not. His anomalous responses became evident in the way the child responded to others and to his environment. The brain injured child might have normal vision and hearing. He might have difficulty learning and even though he did not display a deficiency in intelligence, he had a definite problem. He was often difficult to deal with in school. He frequently acquired emotional problems because he knew he didn't belong. His behavior might have been seen as misbehavior.

Veit summarized the characteristics physicians look for when describing a brain injured child. These features were: "emotionally unstable, lack of inhibition, impulsive action, irritable, talkative, well oriented—they know the time, the place, the person, attention impaired, visual perceptual difficulty and restlessness." No one pattern of behavioral dysfunction, however, could be said to describe all brain injured children. The child might display no obvious behavioral disturbances or might exhibit serious problems of social, intellectual and interpersonai functioning which often were indistinguishable from the major psychoses of childhood.

There were few reliable sources of the number of brain injured children in the population. It was estimated there were two and one-half million of these children in the United States. Because brain injury

---

1 H.N. Veit, a part of a Symposium on the Brain Injured Child, Marquette University, Brooks Memorial Union, 1958, p. 4.

was not a reportable ailment not many exact figures existed as to the number of these children. Five percent seemed to be the most frequently mentioned reliable estimate.\textsuperscript{1} It has been stated that thirty per cent of the brain injured grow up in a normal society and, within limits, they achieve a satisfactory adjustment to life without professional help.\textsuperscript{2} There were a greater number of boys than girls identified in school as brain injured children.\textsuperscript{3} There were several reasons for this. It was possible that the larger size of the male fetus might be a factor in making the male more prone to injury during the birth process itself. It was also wise to consider the well known theory that the male organism being a more delicate organism than the female was more liable to be defective.

Purpose

It is the aim of this writer to present the contributions of recognized specialists who have studied brain injury. The relationship between brain injury and education will be stressed in this historical review of the research. This paper will attempt to review the work of many, beginning with the experiments of Itard in 1799. It was not until the 1920's, however, that studies of the effects of brain injury appeared on any large scale. This review will progress from the work of Itard to the present.

\textsuperscript{2}Hood, Your Child or Mine, p. 173.
Definition of Terms

It must be noted that many different labels have been applied to this problem such as "Minimal brain damage," "minimal chronic brain syndrome," "minimal cerebral dysfunction," "maturation lag," "hypokinetic syndrome," "Strauss Syndrome," "central nervous system impairment," "neurophysiological immaturity," "chronic brain syndrome," or "special education difficulties" the last which was a favorite of educators.

The National Institute on Neurological Diseases and Blindness of the U.S. Public Health Services and the National Society for Crippled Children and adults have suggested the term minimal brain dysfunction. However, these groups were made up primarily of physicians; thus the term is one which implies cuasation. Special educators working with the Terminology Compatibility Branch, National Center for Educational Statistics in the U.S. Office of Education use the term "learning disabilities." However, according to some authorities brain damage is a broader term. It must be understood that this term might not be entirely satisfactory or accurate because for many persons it implies connotations of irreversible injury. This is despite the fact that it is not always possible to demonstrate conclusively the presence of an actual brain lesion or injury. However though the writer recognized the inadequacies of the term, it was felt that other terms were deficient.

Limitation of Problem

This study has been limited to research dealing with brain injury and its implications for education. Because of the great amount of literature available on this subject it has become necessary to deal primarily with the brain injured child in the elementary school setting.

---

CHAPTER II

Review of Literature

Itard\(^1\) was considered to be the first scientist to attempt the education of the mentally deficient. In 1799 he discovered the Wild boy of Aveyron in France. Itard was convinced with education the boy could become an acceptable human being. Itard's Environmentalist Theory, which utilized sensory training, was used to teach the wild boy. The child did become quite humanized in behavior but Itard was not satisfied with the child's growth in intelligence and understanding.

Inspired by Itard, Seguin\(^2\) continued the research in mental deficiency. The superficial and the profound were two new types of feeble-mindedness identified by Seguin. Superficial idiocy was the injury of motor or sensory nerves of the peripheral nervous system. The brain was thought to be intact but did not function properly due to defective receptors. Malfunction was due to the fact that only weak impressions were gained through the senses. Thus Seguin's method for improving the brain function was by proper training of the damaged senses so that correct impressions might reach the brain. Profound idiocy was defined as the

---


\(^2\)Edouard Seguin, Idiocy and its Treatment by the Physiological Method (New York: Reprinted by Teachers College, Columbia University, 1964), passim.
condition which resulted when the central nervous system or brain was damaged. Sensory training was used to help this deficiency too because there was no effective way known to train the central nervous system. Sanguin’s work both in France and later, in 1840, in the United States, resulted in the first systematic approach to the training of the feebleminded.

Several other men were also important in this historical summary. In his studies of the cretin, Guggenbuehl employed simple techniques of teaching these children and attempted a solution to the educational aspects of the problem. The first institution for the feebleminded in the United States was established by Howe. He was joined by Seguin in starting a program for helping the mentally limited child. At the end of the nineteenth century a new program appeared. Many children were found who were not so deficient as to need permanent institutionalization but showed retarded intellectual development. At this time the problem of proper intellectual measurement was solved by Binet and Simon. Their first intelligence test was to be a means to separate the normal student from the mentally deficient one. It was interesting to note that at this time it was suggested that mentally deficient children be taught as much as they could learn but they were not expected to be brought up to a "normal level" or to become more intellectual. It was at this point


that the writer questioned the emphasis on identifying symptoms as the complete answer to all problems. It was obvious that there were too many variations in behavior of mentally deficient children and their responses to educational methods which could not be explained by intrapersonal differences. Thus, the field of medicine must be briefly considered.

In 1861 it was proven that when a lesion was found in a specific area of the brain, motor speech was destroyed.\footnote{P.P. Broca, "Sur le Siege de la Faculte", du Langage Articule avec deux Observations d'aphemie, (perte de da parole), Bull. Soc. Anat., 6, August, 1861, in The Mentally Retarded Child (New York: McGraw Hill, 1965), p. 241.} This was the beginning of much research in the field of brain function. During World War I Head and Goldstein\footnote{H.A. Head and Kurt Goldstein, "Psychologische Analysen Hirnpathologischer Falle, Ambr. Barth, Leipzig, 1920, partially trans. in Source Book of Gestalt Psychology (New York: Harcourt, Bruce and World, 1938), p.10.} developed a broad view of localization of psychological functions in the brain. They worked with soldiers who had received head injuries. Deficient skills and general behavior were noted after brain injury. The young men showed a great deal of impairment which corresponded to the brain area which had been damaged.

After the results of researchers such as these were accepted, another question arose. Was it possible that the disturbances resulting from brain injury in adults might also be present in brain injured children? This question changed the concept of mental deficiency or lack of intelligence. It was necessary to determine if brain injured children had characteristics the same as those of the hereditary mental defective or did their psychopathological pattern of behavior resemble that of the patients of Head and Goldstein? There were many children with no motor
defects but whose obvious lack of intelligence appeared together with a
history of brain injury. All these children came from families of normal
mentality; they showed a history of prenatal, natal, or postnatal damage
to the brain, and medical examination showed slight neurological signs
but no obvious motor impairment. This new syndrome was called "exogeneity"
by Larsen\(^1\) who labeled this group of children with neurological defects.
This syndrome was in direct contrast to that of children who were called
feebleminded due to heredity and were labeled the "endogenous" type.

In 1949 Strauss with Lehtinen\(^2\) entered the field with their
theories. They dealt with children who displayed intellectual and person-
ality aberrations as a result of damage to the brain substance. For a
period of twenty years Strauss studied this type of child. He made the
largest contribution of the decade to the field of brain injury. The
following are seven criteria, the first four being behavioral and the
last three biological, which identify the "Strauss-type" child:

1. perceptual disorders - these children see parts instead of wholes
   when viewing pictures and make figure ground distortions
2. perseveration - children continue at an activity when started and
   experience a great deal of difficulty in changing sets
3. thinking or conceptual disorders - children organize thoughts and
   materials differently from most normal individuals
4. behavioral disorders - children exhibit hyperactive, explosive,
   erratic and uninhibited behavior
5. slight neurological impairment
6. a history of a neurological impairment
7. no history of mental retardation in the family\(^3\)

Even if the last three biological signs were negative the child might be

---

\(^1\)E.J. Larsen, "A Neurologic - Etiologic Study on 1000 Mental

\(^2\)A.A. Strauss and Laura Lehtinen, "The Brain Injured Child," in
Exceptional Children in the Schools, ed. by Lloyd Dunn (New York: Rinehart

\(^3\)A.A. Strauss and Laura Lehtinen, Psychopathology and Education
diagnosed as having the "Strauss syndrome" on the basis of behavioral characteristics. The child was characterized by his behavior not his brain injury.

Werner and Strauss\(^1\) reported the tendency of the brain injured child to form unusual processes. The child might pass far beyond the given situation in time and space. He might also become so involved in detail that he would deviate from the main task and build his thoughts around the detail. An important discovery of Strauss and Werner\(^2\) was learned in a sorting test which compared brain injured mentally deficient children and non brain injured normal children with a group of non brain injured mentally deficient children. The concept formation of these children was tested by the use of fifty-six different objects. After the child saw and named each of the objects he was told to put those things together which went together. The following observations were made as a result of this test: the brain injured child sorted the objects according to color or form, or according to an unessential detail; the child saw a vague or farfetched relationship between objects in regard to their function; the child tended to put together objects on the basis of their relationship in an imaginary situation. Thus, the results showed that the brain injured child was easily given to responses which were farfetched, uncommon and usually peculiar.

Strauss described the brain injured child as often being erratic, uncoordinated, uncontrolled, uninhibited and socially unaccepted. The


catastrophic reaction was another behavior manifestation Strauss used to describe the brain injured child. This was a state in which the child would burst into explosive crying when confronted with a difficulty. An insoluble problem would provoke this reaction. The child was said to have overtaxed the limit of his mental and emotional tolerance.

"We cannot appreciate the problem of the brain injured fully because we cannot truly experience it," said Strauss. He felt it would be difficult to reproduce unpatterned behavior in ourselves, thus it was impossible to empathize with the individual who had few patterns. We group and regroup our patterns at all times when meeting the demands of new situations but the brain injured child does not do this. Strauss described the impossibility of seeing what the brain injured saw, feeling what they felt or experiencing the processes which resulted. At the present time physiological and psychological theory are advancing to open the way to the understanding of the mechanisms by which such conditions can be explained.

In 1960 Doman, Spitz, Zueman, Delacato and Doman developed an unusual educational treatment. They surmised that brain injury resulted in a neurological upset which could be helped by taking the child through the progression of neurological organization. This organization moved from primitive to more complex forms of perception and movement. The Doman Delacato Method stressed the need for the brain injured child to move through the following seven stages of mobility:

---


1. movement of the arms and legs without bodily movement  
2. crawling in the prone position  
3. creeping on hands and knees  
4. walking with arms used extensively in balance  
5. walking with arms not necessary for balance  
6. walking and running in different patterns  
7. using the hands and legs to perform tasks other than those involved in mobility

An attempt to identify relevant variables that would aid in long range prediction of academic achievement in brain injured children was made by Scherer.¹ He developed his theories with forty-six subjects. Their average age was five years, four months. They were given a battery of psychological tests with ratings obtained on several relevant variables. The specific variables utilized were intelligence, academic achievement, social adjustment and evaluation of organicity including examiner noted qualitative and organic characteristics. The examiner reexamined the child after a period of one month to compare ratings. The adjustment to test situations was rated on a five point scale based on such items as cooperativeness, effort, interest and energy. Adjustment to the home situation was rated by parents but this proved to be an inadequate measure. Finally the child's physical status was determined by a study of the child's vision, hearing, motor and speech. The children were retested after an average interval of five years two months, with added measures of academic achievement. He stated that none of the other factors such as social adjustment, test adjustment, organic traits, emotional adjustment and physical status which had all been thought to be related to academic achievement were of any value.

Another approach to psychomotor development was outlined by Freidus.²


She stressed a variety of techniques for developing body image. Included in her constructs were feeling and naming parts of the body, counting on the body and crawling under bars. Perceptual training was also important in helping the brain injured child.

Frostig was one of many who focused on visual perception. She felt the neurologically handicapped child could be helped through the aid of paper and pencil exercises. She also published a visual perception test, standardized on a sample of 434 normal children whose ages ranged from three-and-one-half to eight years. The test was administered to a sample of seventy-one children who had been previously diagnosed as neurologically handicapped or suspected-neurologically handicapped. All these children had learning difficulties. Perceptual disturbances were found in nearly all of the clinical sample. The perceptual difficulties were not uniform. The test showed that a given child might function well in some perceptual areas while in others there were disturbances. It was also shown that disturbances were likely to occur in different degrees in different areas. Frostig claimed that specific training based on these test results showed clinically observed changes in perceptual ability and improvement in academic learning.

Thus, the various educational approaches based on theoretical-clinical literature included psychomotor development, perceptual training. Kirk and McCarthy devised a quantitative test of psycholinguistic abilities


for children whose ages ranged between two and nine. It attempted to measure the level of development of the child in nine different psycholinguistic abilities and to pinpoint areas of weakness. Whether such deficits can be ameliorated by specific training is the subject of present on-going research in the training of psycholinguistic abilities. McCarthy and Olson studied the validity of the ITPA and found fault with parts of the diagnostic validity design. However, they also contributed useful information for further ITPA revisions. The experimental edition of the ITPA was clinically used for five years. Then, during a three year period, the test materials and procedures were redesigned. At that time the test was restandardized, using the effective aspects of the original test, and published in 1968. In testing the effectiveness of a group language program with trainable mental retardates it was found that the younger and brighter the subjects were, the more positive were the results which were obtained from language training.


Identifying the Brain Injured

There are many problems which exist in identifying the brain injured child. Clements\(^1\) discussed the prevalent use of unsuitable tests to evaluate the brain injured child's intelligence. He suggested that such tests as drawing of persons or objects, projective techniques or twenty minute interviews were inadequate even as screening devices. The intellectual functioning level of the brain injured should not be evaluated in those ways. He discussed use of the WISC.\(^2\) Three pattern principles have emerged in relation to the brain injured child's score on this test. WISC Pattern I was characterized by scatter in achievement in either Verbal or Performance Scales. Since the final Verbal and Performance I.Q. scores might turn out almost equal the individual interpreting the results would ignore the internal variations in subtest areas. WISC Pattern II was one in which the Verbal I.Q. was fifteen to forty points higher than the Performance I.Q. The Full Scale I.Q. was then meaningless as an overall picture since it was merely a composite of two very different phases of intellectual capacity. WISC Pattern III was the opposite of Pattern II in that the performance I.Q. was ten to thirty points higher than the Verbal I.Q. The same incorrect summary of Full Scale I.Q. would result. This is just one example of the problems which could result in testing the child who is a victim of brain injury.

It has been found that the usual neurological examinations were

---


often performed inadequately. The examining physician was looking for clear, unequivocal signs and was not aware of "soft signs" which the brain injured child might display.

The advantages to using the Gesell Developmental and Neurologic Examination to identify abnormal behavior in young brain injured children were noted. It was felt that the test gave the same results when used by many people. It could predict later development in the child and thus could be considered valid. The examination was able to examine the patterns of behavior in which abnormality occurred. It could show that since development was an orderly process the criteria for deviation from the normal could be well specified. This meant that behavior expected at the next stage could be predicted from that seen at earlier stages. If abnormality was to be detected in older children it was felt that the use of developmental sequences were needed in building additional tools.

Strauss and Kephart emphasized the diagnostic value of the marble board test in detecting the effects of brain injury. This

______________________________________

1 Arthur Gesell, Gesell Developmental Schedules (New York: Psychological Corporation, 1949), passim.


test involved the use of two like square boards each one having ten rows of ten holes. The examiner put a design on one by putting marbles in certain holes. The subject was then asked to reproduce the design on his board. A record of the location and sequence of placements then was made for each pattern. This psychological test was one suggested by Strauss as showing the greatest promise in differentiating between brain injured and non brain injured children. However, he emphasized that the test not be used to provide the criteria of brain injury where the neurologic examinations were negative, unless more extensive testing was done.

Educating the Brain Injured Child

It was the consensus of many educators that the brain injured child attend a preschool class of "normal" children to develop his socialization.¹ This well organized activity, even for a short time, would help the child prepare for his first school experience. The nursery school would give him normal patterns to emulate. Some brain injured children tended to be hyperresponsive. A child of this type would do well in a school that stressed rote learning.² He would feel inadequate in a class that demanded constructive, independent thinking. School should serve to make him a comfortable, proud person. School could also make him insecure, tense and unhappy. It was essential that he be placed in the proper environment which would adequately serve his needs.

There has always been much controversy concerning the education of the brain injured child in a special class versus a normal class.

¹Richard Lewis, Alfred Strauss and Laura Lehtinen, The Other Child (New York: Grune and Stratton, 1960), p.120.

Paine\(^1\) stressed the importance of educating the majority of the mildly affected children in regular classes. He felt that if his problems were understood and accepted, the appropriate concessions could be made to educate the child. Such approaches as the granting of short breaks to minimize the long periods of sitting still and the avoidance of a great deal of pressure were the important aspects the teacher must consider when educating a child with this handicap. Lewis, Strauss and Lehtinen\(^2\) emphasized the importance of differentiating between the brain injured child of below normal intelligence and the retarded child who was not brain injured. If this were not recognized the education of the brain injured child would be inadequate in relation to his future learning.

The specific disabilities in perception, language and concept formation of many brain injured children should be taken into consideration in a learning situation. The mental processes of the brain injured student do not support one another as they normally should. Lewis felt that the program for the brain injured child should be vastly different from that of the normal child. He suggested the special class as a beginning. The child's problems of distractibility should determine the physical aspect of the classroom. Lewis stressed such drastic procedures as using a screen to separate the child from his classmates to make him less distractable and better able to concentrate. It was necessary for the brain injured child to proceed at his own pace in the special class intended for him. The child should learn to overcome his handicaps. It was hoped, after one or two years in the special class,
that the brain injured child with normal intelligence could be returned to regular classes at his own age level. It was important for the child to have this special help at the beginning of his formal learning experience.

Clements\(^1\) suggested ideas for setting up special classes in a public school. The population for these classes should be well defined. It was essential to have multi-disciplinary team approaches to educational planning and continual evaluation. Children and parents needed to be counseled. Emotional problems should be distinguished from perceptual defects. It was necessary for special education programs to be defined in the proper legal category. The selection of qualified personnel was essential.

It had been stated that the best classroom in the community for normal children was the worst place for brain injured children.\(^2\) The classroom for the brain injured must serve to minimize the children's problems as much as possible. Noises should be kept at a low level, thus the room should ideally be far from outside and inside noises. Bathroom facilities should be nearby. A drinking fountain and washbasin should be located in the classroom if possible. All cupboards and lockers should be kept closed to minimize the distractibility of some of the children. Decoration of the room should be done in subdued tones. At least three feet of space should be allocated to each child to prevent the child sitting too near to his neighbor. Cubicles could be helpful for some children. They should be approximately thirty inches in width.

---

\(^1\)Clements, *Children with Minimal Brain Damage*, p. 29.

and forty-eight inches in height and painted a dull color.¹

Teaching techniques were also a vital aspect in the learning of the brain injured child. Kephart² suggested the development of certain basic generalizations rather than specific skills and performances in the brain injured child. The effects of brain injury in early childhood do not interfere with specific performances but make difficult the development of generalized responses such as form perception and concept formation. When operation on a high level became impossible Kephart suggested the necessity for the child to go back through the stages of development to determine at what stage he had broken down. It was necessary for the child to learn the more basic skills at lower levels of development. As these skills were learned and the resulting generalizations were formed, instructions could be advanced to higher levels.

Strauss and Lehtinen³ offered suggestions for the teaching of the brain injured child. Lehtinen's guidelines included: a school environment which would not be distracting to the child; the window panes should be translucent not transparent; teachers should dress simple and without ornaments; classes should be located on the top floor and distracting stimuli be absent; to reduce distractions screens and cubicles should be used; individuated instruction should be maintained; a maximum of twelve children should comprise the class; pupils should be

¹Paine, Learning Disorders, p.392.


³Strauss and Lehtinen, Psychopathology and Education of the Brain Injured Child, pp. 10-20.
removed to the outside of the group for individual work; the utilization of an elemental rather than global approach to teaching should be maintained; the use of colored words, letters and numbers was suggested; involving motor activities in academic learning was also suggested; the basic tool subjects should be strongly emphasized; the project or unit method should not be used in this classroom; there should be no emphasis on social activities, group learning or oral language; the use of cursive rather than manuscript writing was suggested; and concrete objects should be used to teach concepts.

In 1960 Frey\(^1\) conducted a study to test Lehtinen's teaching techniques with brain injured children. He used twenty neurologically impaired children who exhibited perceptual disorders on psychological tests. They had also been under a special instructional program using those techniques of Lehtinen. These children were compared with twenty non-brain injured retarded students of similar ages and intellectual capacity who had been attending the usual programs in special and regular classes. The brain injured children were found to be superior in silent reading tests and in their ability to blend sounds. These same children also had a normal profile of reading errors but the non-brain injured children showed excessive errors in faulty vowels, faulty consonants, substitution of words and omissions of sounds. This study demonstrated the success of the Lehtinen techniques in reading for the brain injured child. Although this research dealt with retarded children it suggested the applicability of these techniques with the brain injured child of normal I.Q.

Kaliski\(^1\) suggested a list of teaching techniques she found useful with brain injured children. Among them were:

1. the use of rhythmic speech, clashinglight, color, rhythm or special auditory stimuli to focus student's attention while teaching him
2. modifying language in verbal instructions
3. the use of diversified concrete interpretation for number work
4. the use of kinesthetic and phonic approach in reading
5. the use of concrete experiences for reading
6. spelling - have the child repeat the word as he writes it
7. the importance of stressing directions in cooking and systematic procedures in general
8. focusing on body image in physical education

She suggested the teacher take nothing for granted, use a structured approach and use various methods to suit educational needs. "Any method that works is a good one," was her overall suggestion.\(^2\)

Further research has been done in compiling a list of learning deficits, behavioral manifestations and remedial approaches in the area of brain injury.\(^3\) Among various clinical manifestations was disorganization; the child seemed unable to carry out a task in orderly fashion. It was suggested that highly structured routines and definite instructions were necessary. The child should get a great deal of individual attention, decreased peripheral stimulation, specific directions for each step of the learning process, short tasks with a clear end in sight for each plus a reward for each correct response. If the child was easily distracted, brightly colored instructional materials should be used to keep the child's attention. The student must be assigned a simple task of short duration, at first, and the material should be put


\(^2\)Ibid., p. 695.

away immediately after use. When perseveration is evident different colors could serve to heighten the child's awareness of the need for different responses. Heavy outlining of the visual figure presented could be of help in enabling the child to perceive and focus on a particular image thus aiding in figure ground perception. When impulsivity is present the child needs to learn causations as a method of adaptation to his perceptual inadequacies. Activities should be encouraged and designed to use up excess energy and provide an outlet for those activities over which the child has limited control. Hyperactivity should be narrowed and channeled into useful pursuits. A calm, simple and uncluttered environment should be provided. When motor hyperactivity is present, fine motor activities such as tying shoes or eating should be stressed. If a child displays a catastrophic reaction to a stimulus he needs to be reassured and helped in such a way that he would be less likely to panic in new situations. If the child is not able to generalize or see different aspects of an object, word or idea, concretism results.

Another approach was described by Mallison, who suggested an assessment of the brain injured child's ability to function, his difficulties and his personality. A dynamic program should be formulated which depends upon the child's age and his family. It should be designed for each individual. The program includes areas of functioning, general behavior and social behavior as well as academic work. Mallison stresses the importance of educational therapy as it serves to help the child develop qualities which will help him function in areas of impairment. It should help the child prepare

---

for either a regular or special school. Therapy could also influence behavior so that the child could remain in the community. It must be noted that educational therapy could be limited not only by the child's potential and ability to function but by factors of the age of the child. This therapy would never be a substitute for special school nor would it compensate for lack of adequate training and recreational opportunities for children as they grow older.

A more general list of suggestions for teaching the brain injured was given by Cruickshank. He felt the child should not participate in auditorium experiences unless he were in good control of himself and the teacher knew in advance the auditorium activity would be non-stimulating. The fire drill could also present some problems. It was obvious that the brain injured child could lose most of the day's positive learning due to the stimulation and tension which could result from his participation in the fire drill. It has been suggested the brain injured children line up and prepare to leave the building but do not leave their classroom except by a special signal prearranged by the principal and the teacher. Special drills should be given to these children when there were no other children moving through the halls. The cafeteria might also cause problems of adjustment to the brain injured child. Lunch should be served in his own classroom until he has full control of himself. Physical education and free play periods in the school also might present problems. Competitive games often require quick thinking and the brain injured child does not always have this ability. It is important for this child to experience success. His environment should be controlled to achieve this goal. The brain injured

---

child should have a unique musical program. He is often disturbed by
rhythmic tunes and has trouble localizing auditory stimuli. Music
should be used at a time when emotional integration has been achieved
by the child. Art, too, if instructional, should wait until the child
feels secure and has achieved success. There are exceptions to these
rules, however, and certain children would be able to perform satisfacto-
ri ly in some of these fields. In his elementary years the child should
be aided in what he can do well but not at the expense of what he can-
not do well.

Burnette investigated the influences of classroom environment
on learning of retarded subjects with high and low activity levels. He
measured the speed with which mentally retarded children learned to read
a list of words in both standard and restricted classroom settings. He
found no significant differences and surmised that hyperactive children
learned equally well in both types of classrooms. In another study it
was stated the brain injured children possessed neural connections which
were less developed than those of other subjects. It was felt that
hyperactivity on the part of the brain injured child was an attempt
to induce more stimulation. Thus it was predicted that increased visual
and auditory stimulation should decrease the activity level of brain
injured individuals. It was found that visual stimulation did reduce
activity level.

1E.A. Burnette, "Influences of Classroom Environment on Word
Learning of Retarded with High and Low Activity Levels," (unpublished

2A.L. Cromwell, A.N. Baumester and W.F. Hawkins, "Research in
Activity Level," in Handbook of Mental Deficiency, ed. by N.R. Ellis
Semmel\(^1\) did not agree with others that the brain injured child possessed erratic, uncontrolled, uncoordinated, disinhibited and usually unacceptable behavior. He did not find the personality traits more frequently among brain injured children than among mongoloid children of similar intellectual capacities. His study explored the functioning of fifty-nine matched mongoloid and brain injured trainable retarded children in community day-school classes. Seventeen trained teachers rated children according to observations of functioning in the areas of self-help, social, motor, academic and vocational skills. He obtained a total behavior rating from the five areas. Semmel's findings showed there was no significant difference between mean area ratings and total behavior ratings for each group. The brain injured groups distribution of motor ratings showed a significantly wider range of score when compared to the mongoloid motor distribution. Variables such as IQ, CA, and MA showed significant relationship to the distribution of total behavior ratings for both groups. IQ and CA were equally related to teacher's ratings of the brain injured subjects and CA had much greater relationship to total ratings of mongoloid subjects than did IQ. Thus the skills of mongoloid and brain injured trainable retardates appeared related more to mental capacity and chronological age than to clinical classification.

Ziegler\(^2\) argued that brain injured children possessed their well defined personality characteristics because they often came from

---


middle and upper class homes where parents put more pressure on the child and displayed more anxiety than the working class parents of familial retardates. Ziegler conducted a research project to test the proposition that familial retardates experience much greater institutional social deprivation than do organic retardates. He used a social deprivation rating scale to compare the institutional social histories of two randomly selected groups of twenty organic and twenty familial retarded children residing at a state school in Connecticut. He included many items in this scale. Topics such as economic circumstances of the home, physical treatment accorded the child, the familial configuration, adherence by the parents to social norms and the attitude of the parents toward their child were utilized. His results showed that familial retardates had experienced significantly more social deprivation than had the organic retardates. Thus Ziegler surmised that reported differences in the performance of the two types of retardates were due in part to motivational differences in the two populations. This was a brief study which offered few details to the reader. It was the opinion of this writer that the research was too briefly described. A need for further study is seen in this field in order to draw any definite conclusions.

In 1956, Capobianco surmised that brain injured children did not display great variability in their abilities and disabilities. He did a study which compared the arithmetic processes of cultural familial retarded children and neurologically impaired subjects. Capobianco found no differences in computation, reasoning, achievement, reversals

---

of understanding of the zero concept. It is necessary to mention that in this study he dealt with neurologically impaired children as identified by a physician. Thus these brain injured children studied had biological signs rather than behavioral traits alone.

The effectiveness of special education for the brain injured was studied by Gallagher.\(^1\) He conducted a three year experiment in a residential school setting. The study involved tutoring neurologically impaired children from ages seven to nine years. One hour per day of individualized tutoring based on the child's own pattern of strengths and weaknesses was given each pupil. Gallagher described it as a "crash program" of perceptual, conceptual and language development exercises. No attempt was made to follow the Lehtinen approach. Gallagher contrasted the above group to a control group. He found his experimental subjects improved in intellectual development, increased in attention span and learned more in verbal than in nonverbal skills. Thus he found evidence that the Lehtinen techniques were not necessary to achieve good results with neurologically impaired pupils. It is the feeling of this writer that this particular study did not provide sufficient evidence to warrant discontinuing use of the Lehtinen techniques. It was not difficult upon further reading to find an opposing view, although not a convincing one either.

A group of researchers studied forty subjects, twenty who were diagnosed as brain injured and twenty as emotionally disturbed.\(^2\) The


brain injured were hyperactive and aggressive as well as having been detected by neurological tests. A Lehtinen type classroom was created for the experimental group, those who were diagnosed as brain injured. The teachers of the contrast groups, those with a diagnostic classification of emotional disturbance and no conclusive evidence of specific brain injury, were allowed to set up any type of environment they chose. Many of them used the Lehtinen techniques similar to those used in the experimental classes. It was evident that the treatment became confused. Thus the statistical evidence which found that the experimental groups made greater progress than the controls could not be convincing. Obviously this theory needs further investigation.

Rost and Charles evaluated the cubicle method of reducing stimulation for hyperactive and brain injured children. Children in primary and intermediate classes for brain injured were divided into experimental and control groups. The students all sat together for lessons requiring teacher explanations but otherwise the experimental groups went to their booths while the control group remained at their desks. Each child in the experimental group spent one and one-half to two hours of the three hour day in the booth. Pre and post tests were administered. There were no advantages found in the isolation booth method. However circumstances contributing to non-significance could have been the length of the experiment which was only one semester, teacher attitudes and individual pupil problems unrelated to the study.

The management of the classroom is one of the most important factors that contributes to the success of the instructional program for the brain injured child. The child should learn to live with people in the classroom. Acceptable self-maintenance is also important in the classroom. Hopefully the student will learn to recognize others as individuals who also have needs and desires. The teacher should have skill in dealing with the brain injured child. She should know when the child is ready to assume responsibilities. She should also be consistent for this seems imperative when dealing with this type of child. Each child should be treated individually. The teacher knows no two children could be alike.

The teacher must be a patient person and satisfied with small gains. Flexibility is also important since the teacher should accept the unusual in behavior and language. She should provide structure and set limits making sure the child understands the reason for this. The teacher must be creative and secure enough to react quickly if the material is too advanced for the student. Since some brain injured children need a closer physical relationship with adults the teachers themselves must be well adjusted individuals. The period immediately after the child arrives at school is important. It is a crucial time due to the child's exposure to many different stimuli on the way to school. The potential for failure is greater at a time when tensions are present.

1Paine, Learning Disorders, p. 39.

The teacher must be careful to insure that work given the student at this time can be accomplished successfully. It is not possible to give the child a correctional device as a brace is given to the crippled child. Teachers have to recognize the brain injured child's disability is there and will remain there after the child is placed in the proper educational setting.

Parents of the Brain Injured

Anderson\(^1\) states that parents of a brain injured child have been subjected to undeserved trauma. They have difficulties coping with their child and seem to bear unnecessary guilt. She explains the guilt rests with the many experts to whom the parents have gone for help. These so-called "experts" often did not recognize the problems of the brain injured child. It might take as long as two years from the time the parents looked for help until a competent diagnosis was made. Then treatment has to be found and that was often difficult. These children usually didn't ask for help because they were not aware that they needed any. It was not the person who had sustained the brain injury early in life who was the troubled person, it was the one involved with him. At the beginning it would be the parent, then it would be the teacher and lastly the spouse. Each of these persons feel a sense of helplessness in coping with the problem. Parents need encouragement to keep experiences from day day to day simple and stable.\(^2\) They need to be firm and able to enforce orders. Warmth is as important as firmness. Parents must also be emotionally


\(^2\) Ibid., p. 177.
Parents find a home training program, as suggested by Mallison,\(^1\) to be important. This training at home (along with educational therapy) can prove successful when dealing with the brain injured child. Teaching the parents how to assist their child is a very effective way of working with the brain injured. The individual parents are taught how to deal with their child at the specific stage of his development. It has been found that when the parent works with his own child he will find out for himself what the child's real limitations are. The parent will in all probability, be much more amenable to ideas regarding special class placement, transfer to a special school or residential school where these are indicated. Home training also gives the parent and child a new pattern for living together during a certain time of the day. Various things can be done at home with the child. Establishment of handedness can be helped. If the child is left handed, for example, the parents are told to hand him items for the left hand and place things on his left. Some children need training to establish a dominant hand. The parents need to be aware of unnecessary confusion that can result from constantly trying to switch the child's hands. The parents can often make use of simple manipulative toys which teach colors, sizes and counting. Teaching the child to draw is also an important phase of learning. Motor coordination can be worked on at home with the use of large crayons and a heavy stencil cut from cardboard. Training in visual and auditory memory can be done with a matching game like picture-dominos. Mallison stated the importance of individual work prior to group placement for many neurologically impaired children especially the younger ones.\(^2\) If the child is

\(^1\)Mallison, *Education as Therapy*, p. 37.

\(^2\)Ibid.
able to respond to home training and educational therapy and to achieve some measure of self control he will adjust more easily to a group situation.

Cruickshank\(^1\) suggested to parents of the brain injured child that some place in their home be made to meet the child's needs, often the child's bedroom. Stimuli should be reduced. Toy shelves should have wooden doors; spread and drapes could be of a solid material and the room should be carpeted. It was also suggested that the curtains, walls and floor covering be of the same pastel color. The child should understand that he could go to his room as he desired, especially if he felt tired, frightened or fearful. The room should not be used as a place to punish the child. He should associate the area as a place of calm and quiet. If eating is a problem the reduction of stimuli is important. It might be necessary for the parents to arrange for the child to eat alone. He should not be made to feel that it is a punishment. Perhaps an older brother or sister or the parents could sit at the table with the child in order to assist him and talk quietly with him. The table should be in the corner of the room against walls which had no pictures or decoration. The child should have in front of him only what he needs at that time. Unnecessary items tended to distract him. Various utensils or dishes should be added as the child learns to tolerate stimuli. When the table is large it was suggested that a solid brightly colored placemat be used under the child's plate. This brilliant color reduces the visual field and helps the child focus on his plate. These ideas for the home give everyone a chance to help the brain injured child learn to perceive his world accurately.

Structure has to be maintained in the home as well as in the school. Bedtime, bathtime and recreation have to be scheduled so the child can predict and anticipate the events. Parents have to learn to expect that when the child's routine is upset by unplanned events the child might be more hyperactive afterwards. It seems necessary that parents maintain a stable atmosphere at home by reminding themselves what the child will be like when he returns home from an unusual activity and not be concerned by the temporary level of hyperactivity.

The parents have a very special place in the life of the brain injured child. Their role might sometimes seem like an impossible one if there are other children in the family. It is evident that the parents must be constant arbitraters between the child and his brothers and sisters, his neighbors and his friends. Parents need to watch the child to determine the amount of stimuli and kinds of situations he can tolerate. They, the mother and father of the brain injured child, need to interpret the child's behavior to friends and neighbors to provide understanding, not pity. Other adults have to be assured that the parents themselves are aware of their child's problems and are trying to solve them. When and if the child begins to learn, improves his behavior and earns greater social acceptance the parents are rewarded.

Summary

The term "brain injured" is a very nonspecific term which connotes no exact concept. Abnormal behavior is the outstanding symptom. Many recognized specialists contributed to the field of brain injury. There were important relationships found between brain injury and education. Various educational approaches based on theoretical-clinical lit-

\[1\text{Ibid., p. 146.}\]
erature include psychomotor development, perceptual training and concept formation.

It is the feeling of many educators that the brain injured child should attend a preschool class for normal children to develop his socialization. There is much controversy concerning the later education of the brain injured child in a special class or normal class. It is known, however, that the best classroom for "normal" children is often the worst place for brain injured children. Teaching techniques are a vital aspect in educating the brain injured child. The role of the teacher is important in influencing proper learning. The classroom environment plays a necessary part in the education of the brain injured child. Parents contribute to their child's emotional, social and learning skills. The mother and father of the brain injured child hold an important job which often proves to be a difficult one.
CHAPTER III

Conclusions

The contributions of many recognized specialists in this field of brain injury have been presented. Various relationships between education and brain injury were demonstrated. Petersen\(^1\) summarized the educational needs of the brain injured child in this way:

1. understanding of their problems and acceptance of them as worthwhile individuals by the teacher and other school personnel
2. a good working relationship between the school personnel and the parents
3. a well organized classroom
4. a structured classroom program including limit settings
5. teacher imposed controls when pupil controls are not enough
6. consistency and routine
7. a success program, both academically and socially
8. the opportunity to assume more and more responsibility for their own behavior with teacher support and guidance

In the past years many exciting things have happened in this field. The presence of the brain injured child has been accepted; his wants have been defined; a system of education for the child who can learn has been developed for a long enough period so that it can be considered workable.

Implications

It has been predicted that in the future, perhaps in less than fifteen years, school systems will establish separate training classes for ambulatory brain injured children. The methods used in these classes

will differ from those used with the retarded child of fixed limitations. This approach should help the child who is scholastically able but has to learn to make a social and emotional adjustment in school. This child will find complete help for the first time in this class.1

The importance of adequate services for children with brain injury should be recognized. These services should include accurate diagnosis and recommendations for appropriate and effective remediation. This could also include extensive collaboration and consultation between and among community agencies, physicians and school systems. It has become necessary for the present school system to end the extreme hardships and pressures on children whose improperly working central nervous system has not been recognized.

Drug therapy has been found to be valuable in treating some brain injured children. This new field may have an important role in helping the child. It should be stressed, however, that any drug must be administered under carefully observed conditions for a period of time before its effectiveness can be evaluated.

It has been shown that there is much hope for the brain injured child in connection with various types of research. School supported by or closely connected with universities and professional groups do the greatest amount of well-defined research. These schools operate on an experimental basis and often are provided with adequate funds to follow up test findings and research.2


2Ibid., p. 27.
The future of the brain injured child will depend upon many variables. The most important factors to consider are the child's basic intellectual capacity, the degree and time of the occurrence of the brain injury and what the child has experienced since the injury. The brain injured child has problems of perception, concept formation and generalization. Perseveration and inadequate language may be evident in the brain injured child. The child's behavior may be inadequate due to improper responses to his environment. The most annoying variant to parent and teacher of the brain injured child must be hyperactivity and distractability. It is essential that the brain injured child's parents and teachers realize how little control the child often has over much of this behavior although it may appear willful. It is important that the child learn to channel his energy into acceptable behavior. When all these problems are understood then and only then will there be a solution.
BIBLIOGRAPHY

Books


Seguin, Etuard. _Idiocy and Its Treatment by the Physiological Method_. Albany: Brandow, 1866.


Articles and Periodicals


Haskell, R.H. "Mental Deficiency Over a Hundred Years." American Journal of Psychiatry, 100 (April, 1944), pp. 107-18.


Kirk, Samuel, and Bateman, Barbara. "Diagnosis and Remediation of Learning Disabilities." Exceptional Children, 29 (September, 1962) pp. 73-78.


Exceptional Children in the Schools. Edited by Lloyd Dunn.

_____, and Werner, Hans. "Disorders of Conceptual Thinking in the
Brain Injured Child." Journal of Nervous and Mental Diseases,

_____, "The Mental Organization of the Brain Injured Mentally
Defective Child: the Mentally Crippled Child." American

Tarnopol, S.D. "Delinquency and Minimal Brain Dysfunction." Journal

Werner, Hans and Strauss, Alfred. "Types of Visual Motor Activity in
Their Relation of Low and High Performance Ages." Proc. American
Mental Deficiency, 44, No. 1 (1939), p. 163.

_____, "Impairment in Thought Processes of Brain Injured Children."
American Journal of Mental Deficiency, 47 (January, 1943),
pp. 291-95.

_____, and Thuma, B.D. "A Deficiency in the Perception of Apparent
Motion in Children with Brain Injury." American Journal of

Wong, James. "A Note on the Concept of the Brain Injured Child."
American Journal of Mental Deficiency, 61 (July, 1956), pp. 204-7.

Yates, A.N. "The Validity of Some Psychological Tests of Brain Damage."

Ziegler, E.N. "Social Deprivation in Familial and Organic Retardates."
Psychological Reports, 10 (April, 1962), p. 370.
Unpublished Materials


Frey, R.M. "Reading Behavior of Brain-Injured and Non-Brain Injured Children of Average and Mentally Retarded Development."