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INTELLIGENCE AND SOCIAL MATURITY CHANGES IN  
FEEBLEMINDED CHILDREN

by

Marguerite Jean O'Brien

A Dissertation Submitted to the Faculty of the Graduate School  
of Loyola University in Partial Fulfillment of  
the Requirements for the Degree of  
Doctor of Philosophy

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1953

## LIFE

Marguerite Jean O'Brien was born in Detroit, Michigan, March 19, 1926.

She was graduated from Immaculata High School, Detroit, Michigan, in June, 1943. At the University of Detroit, the degree of Bachelor of Philosophy was conferred in June, 1947, and the degree of Master of Arts in June, 1949.

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## CHAPTER I

### THE NATURE OF MENTAL DEFICIENCY

The existence of wide individual variations in intellectual endowment is a universally recognized fact. Like all traits and capacities, intelligence is distributed throughout the population in a manner which, when graphically represented, closely resembles a normal probability curve. It is with the individuals falling at the extreme low end of this distribution that the present study is concerned. More specifically, it deals with the problem of constancy versus modifiability of certain of their traits and capacities following environmental changes.

Concurrent with the establishment of a newly organized school for retarded children, this study was initiated. Parents of children whose low IQ's precluded regular school attendance founded a group known as the Retarded Children's Aid. Their purpose was the training, study, and general betterment of intellectually handicapped children. The first major project of this group was the establishment of a play school designed to accommodate fifty retarded children, providing them with supervised play experiences, outdoor group activities, rhythm exercises and training in the simpler crafts. School sessions were planned for

five days a week, four hours a day. The children admitted to the school ranged in IQ from 50 downward, and the only stipulation made was that the child be able to walk alone.

Prior to admittance to the school, each child was given a complete physical examination. At that time tests of intelligence and social maturity were also administered. Following six months of school attendance, each child was retested with the same instruments, permitting a comparison of scores before and after the play school experience.

It was recognized that should changes be apparent in these children following the school experience, the question would arise as to whether the changes could be attributed to the training they had received or to other factors. Inasmuch as their environments remained constant before and during school attendance, it was felt that the "other factors" would be principally the natural processes of growth, maturation, and learning.

Ideally this problem could have been solved by the comparison of this group with a control group. The hypothesis in question would be that play school attendance alone was productive of any changes which occurred. To carefully test the hypothesis the two groups would have to be so set up as to permit of only one variation, that is, school experience for one group, and a lack of such experience for the other. Holding constant all other variables would necessitate complete equation of the two groups with regards to any factors which might influence intellec-



tual or social development. These factors would include socio-economic level, family size, position in the family constellation, national background, religion, amount and kind of previous training, and many others.

The next question to be considered was the feasibility of procuring such a group. Prior to the problem of equating the two groups was the problem of locating a sufficient number of cases for a control group. Because of a lack of facilities for the private care of severely retarded children, a large number of them are institutionalized. Of those remaining at home, an investigation of the reasons for their not being institutionalized revealed factors which would at the outset render them not comparable to the members of the experimental group. In many cases parents felt that the child's physical frailty would make institutional life difficult for him. Others had rejected the opportunity to place the child outside the home despite the advantages such placement may have offered. When a child is kept at home under such circumstances, it is usually to satisfy some need on the part of the parents, often resulting in over protection and indulgence of the child. Parents who were interested in institutionalizing their child were eager for placement and were unwilling to guarantee that they would not accept placement for the six month experimental period if the opportunity presented itself. In terms of number and accessibility of cases, those children on the waiting lists of private residence schools would have fulfilled

the requirements of control group cases. But here the vitiating factor would have been the nature of the cases themselves. Parents who place their children in play schools obviously believe that with training their children will be capable of a satisfactory adjustment in the home. On the other hand, parents who desire residence school placement for their child have reason to believe that the home environment is not conducive to the full exploitation of the child's ability. This factor alone reduces the comparability of the two types of cases.

Even in the absence of these factors, it would have been impossible, in view of the limited number of available cases, to exactly match experimental and control group cases for the many other factors which may have operated as variables.

The absence of a control group makes this a descriptive rather than a definitive study. The fact that despite repeated efforts a suitable control group could not be obtained limits the conclusions.

All of the individuals used as subjects in this study may be classified as feebleminded. But, just as there are many qualitative and quantitative differences within this broad category, so too, there have been offered countless definitions of feeblemindedness. A consideration of the more outstanding of these may throw some light on the problem in question.

One indisputable fact which emerges from all of the research on feeblemindedness is that there is no objective basis

for a sharp division between the mentally adequate and the mentally deficient. For the practical ends of legal and educational procedures, such a division is sometimes postulated. But the fact remains that an individual who is regarded as a defective in one social or vocational setting, may seem to function quite normally in another. This brings up the question of exactly what is implied by the terms "feeble-mindedness" or "mental deficiency." Is the deficiency a pervasive thing, or does it manifest itself in specific areas of functioning?

Early in the century, Tredgold, an English psychologist, formulated the following definition of mental deficiency: ". . . a state of incomplete mental development of such a kind and degree that the individual is incapable of adapting himself to the normal environment of his fellows in such a way as to maintain existence independently of supervision, control, or external support."<sup>1</sup>

It is clear from this definition that Tredgold regards mental deficiency as a highly relative thing, dependent to a great extent upon the level of society into which an individual is born. One who is incapable of adapting effectively to the environment of his fellows may adapt quite adequately to a lower level environment, in which demands upon his abilities are less stringent. For example, the child of a professional man may be regarded as back-

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1 A. F. Tredgold, A Text-book of Mental Deficiency, Baltimore, 1937, 4.

ward in his own circle, yet be capable of learning the simple routine skills of the laborer. In other words, in one setting an individual's ability may be adequate, but as environment increases in complexity and more demands are placed upon it, it becomes relatively less and less adequate.

Therefore, when an individual is described as feeble-minded or mentally deficient, it has been deemed more meaningful to interpret the condition as one in which his intellectual ability is so limited that he would be incapable of effecting an adequate adjustment in any environment.

It has frequently been suggested that educability be used as a standard of normality. Actual application of this criterion, however, has proved to be a highly arbitrary one. Unless we assume that educability and intelligence are synonymous, we must consider separately the range of individual differences in each. Educational statistics offer ample evidence of the prevalence of school failures among those falling within the so-called normal range of intelligence. Hence, using educational aptitude as the basis of distinction between the normal and the defective mind is insufficiently justified.

Tredgold explores this educational concept, along with the legal concept, and various others, and concludes, "The question of normality and defect is, in fact, really a biological one, and the best way of arriving at a satisfactory line of demarcation

would seem to be to consider it from this aspect."<sup>2</sup> Pursuing this biological approach, he contends that the essential requirement of all living creatures is the capacity to maintain existence. He explains the process in this way:

By conscious cunning and inventiveness, skill and strategy, intelligence and reason, he is not only enabled to escape his enemies and secure food, but to make provision against contingencies, to protect his body under the most extreme climactic conditions, and by these means he has not merely been able to survive, but has become the lord of creation. In other words, the maintenance of existence in the case of man has ceased to be entirely a matter of brute force, unconscious adaptation and instinct; it has become a conscious process and the essential function of mind. From the biological aspect, therefore, the individual whose mind is sufficiently developed to enable him to maintain an independent existence in the ordinary surroundings and conditions of his race and kind must be regarded as normal, while the one whose mental development falls short of this must be regarded as abnormal and defective.<sup>3</sup>

In contrast to the biological-social interpretation of Tredgold is the theory of Kurt Lewin,<sup>4</sup> who identifies the main differences between normal and defective minds in terms of tension systems and the rigidity of the boundaries by which these systems are separated from each other. Both of these concepts are utilized broadly by Lewin in his theories of learning, and for that matter, of personality development and dynamics in general. He conceives of a tension system as an organized system of responses

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2 Ibid., 2.

3 Ibid., 3.

4 Kurt Lewin, A Dynamic Theory of Personality, New York, ch. 7.

all of which are ordained to lead the individual toward the goal for which he strives. He distinguishes tension systems first of all in terms of the time factor, that is, the duration of the striving, and secondly, in terms of their significance to the whole of personality. An example of a brief and relatively trivial tension system is a child climbing up on a chair to gain access to a cookie jar which is out of reach. A more significant, and consequently more enduring tension system is seen in the case of a man who works his way through college, medical school, and an internship in order to attain his goal of becoming a physician.

The rigidity of the boundaries refers to the readiness with which the energies and activities proper to one tension system can be made to overflow into another. Boundary rigidity seems to be at a minimum in childhood. The baby who cries for the moon is easily comforted and distracted when offered a tin pie plate to play with. Or a child who wishes to go outdoors and play cowboys may be confined to the house because of bad weather. He is disappointed and irritable when told that that cowboy play is too rough for indoors, but within a few minutes he is directing all his interest and energies to a western movie on television. At the adult level this redirection of energies is more difficult to effect. If necessity dictates the discontinuation of a highly desirable activity, it is unlikely that any substitute activity will completely claim the interest engendered by the first. A substitute may act as a temporary distraction, but resumption of

the original task will, in all likelihood, still appear most attractive. In other words, there is little or no breaking down of the boundaries that separate the two tension systems. Whereas the two may merge or at least overlap in childhood, each maintains its own integrity in adulthood. As age advances, the boundaries between systems tend to become gradually stronger. Concomitant with this, there is a clarification of boundaries and a tendency toward greater persistence in the pursuit of goals. Hence, the older person is less adaptable and less capable of shifting from one goal to another.

In addition to this difference in the strength of tension systems and the rigidity of their boundaries, adults also differ from children in their number of systems. With advancing chronological age, interests and goals become more numerous and more diversified.

With regard to the mental organization of the feeble-minded, Lewin maintains that feeble-minded persons resemble normal children in the relative paucity of their tension systems, and are more like adults in the rigidity of the boundaries between these systems. These characteristics are presented diagrammatically in Figure 1.

Explaining the dynamics of the behavior of the feeble-minded, Lewin indicates that basically the feeble-minded are limited to a comparatively small number of goals and interests, and further, because of their mental rigidity, they have little capac-

ity for development. Their activities become stereotyped at a very early age. They are highly resistive to changes in their habit patterns. They tend to behave in a ritualistic fashion, regardless of changing circumstances.

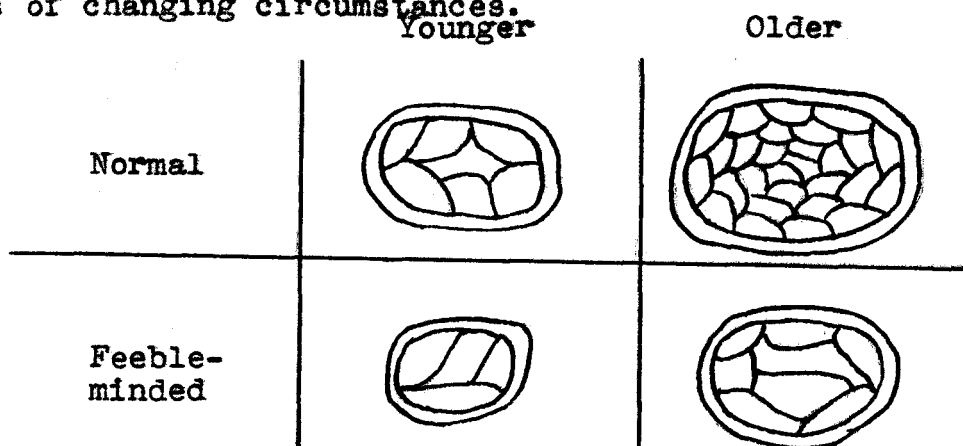


FIGURE 1

DIAGRAMMATIC REPRESENTATION OF LEWIN'S  
THEORY OF FEEBLEMINDEDNESS

(From "A Dynamic Theory of Personality" by  
Kurt Lewin, McGraw-Hill Book Co.)

With the exception of a few general statements, such as the one by Lewin, just cited, which are in line with broad theoretical formulations, it is impossible to discuss the causation of mental deficiency without reference to specific clinical types. Any and all attempts to reduce the etiology of mental deficiency to a formula of mathematical exactness must be met with failure since there are so many factors which still, after years of research, remain unknown quantities. Regarding these "unknowns," J. E. Wallace Wallin, who has devoted many years to the study of



feeble-mindedness, has this to say:

Many theories of feeble-mindedness have been advanced. It is a spontaneous generation, a sport, a mutation; it is an atavistic phenomenon, a reversion to a primitive type; it is an 'uninterrupted transmission,' a 'direct inheritance,' 'through two hundred generations or more' of defective strains from our animal ancestry'; it is a variation due to hereditary taint, transmitted either according to the Galtonian or Mendelian formula; or some cases represent formative defects, some are due to disorders of the endocrine glands, etc.

Amid this welter of discordant views and in the present stage of enlightenment, it would seem bold indeed to attempt to formulate a consistent, adequate, workable theory of causation. Certainly the facts are not yet all in; we do not yet have a sufficient body of incontestably established facts to warrant anything in the nature of a final formulation. Anything like finality will have to await genetics.<sup>5</sup>

This being the case, probably our soundest understanding of feeble-mindedness is to be derived from a consideration of the classifications of ailments, with their individual characteristics and probable causative factors. It should be noted, however, that while many of these categories of defect are distinct and clear-cut, they by no means encompass the whole field of mental deficiency. In fact, the largest percentage of mental defectives belong to a classification in which the causative factors are indeterminate.

Most writers identify the following categories of etiological factors of intellectual deficiency: hereditary, pre-natal,

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5 J. E. Wallace Wallin, "Studies of Mental Defects and Handicaps," Miami University Bulletin, Series XXII, No. 5, January, 1924, 112.

post-natal, and multiple. Some authors, e.g., Thorpe and Katz,<sup>6</sup> further break down the second category in terms of the probable time during the period of gestation at which the factors were operative. These authors identify germinal factors, embryonic factors, and fetal factors.

Many of the earlier and loosely controlled studies in the field seemed to produce evidence that intellectual deficiencies were due to heredity. Re-evaluation of many of these studies however, reveals the use of poor psychological methods and unreliable techniques. It now appears that the inheritance of mental deficiency has been inferred and not actually measured. It has become apparent too, that highly unfavorable social surroundings and poor economic conditions were assigned little or no significance in the production of mental defects. Having reviewed numerous family studies the conclusions of which favored heredity as the chief cause of mental deficiency, Louttit concluded:

In spite of the widespread acceptance of the theory of the inheritance of feeble-mindedness, based upon such studies as we have mentioned, scientific caution demands the withholding of final judgement until all the possibilities of social inheritance are adequately controlled. We cannot accept sociological studies as evidence of biological inheritance.<sup>7</sup>

In recent years the number of cases assigned to the "unknown causes" category has increased considerably. This is

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<sup>6</sup> Louis P. Thorpe and Barney Katz, The Psychology of Abnormal Behavior, New York, 1948, 261.

<sup>7</sup> C. M. Louttit, Clinical Psychology, New York, 1947, 182.

largely accounted for by the fact that previously, cases which could not be accounted for by any known etiological factor were attributed to heredity.

If we cautiously exclude all cases in which social factors, or any factors other than heredity may have played a part, there remains but one which is indisputably hereditary in origin.<sup>8</sup> Amaurotic family idiocy is, fortunately, a relatively rare phenomenon, but from as many cases as are available for study, it seems certain that it is of purely hereditary origin. It appears in very early infancy and childhood, and is accompanied by blindness and various other physical defects. It is believed that the genes involved in the transmission of this defect operate as Mendelian recessives.<sup>9</sup> At birth the infant appears to be normal, but by the fourth month of life there is a general muscular weakness accompanied by failing vision. Frequently epileptiform seizures appear at this stage and intellectual development is arrested. From this point on the disorder progresses and usually terminates in death at about two years of age.

The only neurological findings characteristic of this condition are a cherry red spot on the retina and defects of the

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8 Thorpe and Katz, The Psychology of Abnormal Behavior, 266.

9 M. Sherman, Intelligence and Its Deviations, New York, 1945, 164.

cell bodies in the area of the central nervous system.<sup>10</sup>

There are no known medical or psychological measures which are effective in either curing or arresting the progress of this disorder. Treatment is, therefore, confined to custodial care.

A second type of mental deficiency, known as Mongolism, is now popularly attributed to germinal factors.<sup>11</sup> Because it was so little understood, this condition was previously thought to be inherited. However, research has failed to unearth any positive evidence to support this theory. In the first place, direct transmission of the defect would be impossible, since Mongols very seldom live to adulthood, and those who do are unable to reproduce. Also, it is exceedingly rare to find more than one Mongol in a family.

The theory that Mongolism is due to germinal factors has been advanced by Rosanoff,<sup>12</sup> who maintains that the ovum is scarred, and that this scarring takes place in the cytoplasm, rather than in the nucleus of the ovum. Little is known of the

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10 G. B. Hassen, "Amaurotic Family Idiocy: Clinical and Pathological Studies," American Journal of Psychiatry, 8, 1929, 969-977.

11 Thorpe and Katz, The Psychology of Abnormal Behavior, 267.

12 A. J. Rosanoff, Manual of Psychiatry and Mental Hygiene, New York, 1938, 207.

exact nature of causes of the damage. However, it has been noted without exception that whenever Mongolism occurs in identical twins, both members are Mongols. Since this is the case, it is reasonable to conclude that the etiological factors in Mongolism must operate before the embryonic stage of development, in other words, before the egg divides in two. For this reason, Rosanoff, Handy, Doll,<sup>13</sup> and others believe that the causal factors are at work during the germinal period.

Sherman and Southwick<sup>14</sup> have produced ample evidence that there is a correlation between Mongolism and the age of the mother at the time of birth, and between Mongolism and position in the family. They found that there are almost four times as many Mongols born of mothers over the age of thirty as there are of mothers under that age. Also, Mongolian children most often appear late in the order of birth. They are usually the last or the next to the last in large families.

Ingalls<sup>15</sup> presents much evidence to support the asser-

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13 A. J. Rosanoff and M. A. Handy, "Etiology of Mongolism," American Journal of Diseases of Children, 48, 1934, 764-779; Edgar Doll, "The Feeble-Minded Child," in Manual of Child Psychology, edited by Leonard Carmichael, New York, 1946, 877-878.

14 Mandel Sherman, Intelligence and Its Deviations, New York, 1945, 164; W. E. Southwick, "Time and Stage in Development at Which Factors Operate to Produce Mongolism," American Journal of Disorders in Children, 57, 68-89.

15 Theodor H. Ingalls, "Etiology of Mongolism," American Journal of Diseases of Children, 74, 1947, 147-165.

tion that Mongolism originates between the sixth and ninth weeks of fetal life. He believes that the causative agents related to Mongolism are relatively numerous. Age is probably an important factor, since his figures show that the peak maternal age in the United States is 24, while the peak age of mothers producing Mongoloid offspring is 41. He also points out that the more children there are in the family, the more likely the child with Mongolism tends to be last. This is consistent with the demonstrated relation of Mongolism to advanced maternal age.

Reviewing the histories of mothers of Mongoloid babies, he observes that a large percentage experienced hemorrhage during the course of gestation, many sustained acute infections, and many suffered from chronic disorders such as syphilis, malaria, tuberculosis and alcoholism. He found too, that gynecological disorders can be found in frequent association with subsequent Mongolism.

Ingalls reports a definite correlation of maternal rubella with embryonic pathology resulting in abnormal formation. He also relates the anomalies characteristic of Mongolism to the type of development occurring in the fetus between the sixth and ninth weeks of gestation.

The misleading name, Mongolism, has been given to this type of deficiency, because persons suffering from it are thought to resemble members of the Mongolian race. Actually, the only resemblance is to be found in their almond shaped eyes which slant

toward the nose. Mongols are also characteristically short in stature, markedly underweight, and have a small head circumference. Their heads are usually egg-shaped, they have very small, irregularly spaced teeth which seldom erupt before the age of five or six, and their tongues are long, broad, and thick, marked with deep transverse fissures. Their hands, which feel dry and leathery, are usually broad and stubby, and their feet are wide and flat. Mongols are usually hypersensitive to extremes of temperature, since blood circulation in their extremities is poor. Although generally severely retarded and unable to speak clearly, Mongols are characteristically happy, cheerful, affectionate, and docile.<sup>16</sup>

It has been noted that the higher the intellectual level of the Mongol, the less pronounced are his physical abnormalities. Some can be taught simple skills and the rudiments of reading and writing, but few ever become self-supporting. Their life span is quite short, the largest percentage of them dying before the age of five. Some live to mid-adolescence, but it is extremely rare for one to attain the age of twenty-five or thirty. Here again, since medical treatment has failed to appreciably deter the progress of this defect, the only way of coping with it is providing custodial care.

Embryonic factors, operative from the time of fertiliza-

tion until the eighth week of pregnancy, appear to account for these three forms of mental deficiency: microcephaly, macrocephaly and hydrocephaly.<sup>17</sup>

The microcephalic is characterized by an extremely small head. It is usually conical in shape, long and narrow, with a protruding chin. It seldom measures more than nineteen inches in circumference at maximal growth, and is commonly much smaller. Body stature is usually small and drooping. Speech, if any, is muffled; some never learn to speak at all. They are generally very dull, but even-tempered.

The convolitional pattern in the microcephalic brain is, naturally, very simple. Sometimes the corpus callosum is completely missing. It has been postulated that differences in metabolic activity in various parts of the developing organism during the embryonic period may account for these malformations. Some studies also show that extensive maternal pelvic irradiation may result in malformation of the developing fetus. It has also been demonstrated that extensive application of X-rays to the pelvic region in pregnant women suffering from cancer and ovarian tumors frequently produces microcephalic mental deficiency in subsequent offspring.<sup>18</sup>

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17 Thorpe and Katz, The Psychology of Abnormal Behavior 272.

18 D. B. Murphy, "Ovarian Irradiation: Its Effect on the Health of Subsequent Children," Surgical Gynecology and Obstetrics, 47, 1928, 201-215.



Very few microcephalics learn to speak, but they can sometimes be taught to perform simple routine tasks and to keep themselves reasonably tidy. Until more is known regarding the exact etiological factors involved, little can be done by way of prevention.

The victim of macrocephalic mental deficiency is characterized by having an enlarged head caused by the presence of an excessive amount of the supporting structures of the brain tissues, and the glia cells, but no increase in the active nerve cells of the brain. Sometimes there is an increased amount of cerebrospinal fluid, but otherwise there are no outstanding characteristics. It is believed that the increase in the number of glia cells interferes with normal brain development, but exactly what causes this acceleration in the development of glia cells is not known.<sup>19</sup>

The hydrocephalic also has a greatly enlarged head, but this enlargement is due to an excessive accumulation of cerebrospinal fluid. This accumulation may be found either within the ventricles of the brain or between the hemispheres. These conditions are known as external and internal hydrocephaly, respectively.<sup>20</sup> These individuals present a somewhat grotesque appear-

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19 J. J. B. Morgan and G. D. Lovell, The Psychology of Abnormal People, New York, 1948, 155.

20 L. Kanner, Child Psychiatry, Springfield, 1937, 142.

ance, because only the cranium becomes enlarged, and the face remains its normal size.

The hydrocephalic's head may measure anywhere from twenty-five to thirty inches in circumference, and contain anywhere from one to five quarts of fluid.<sup>21</sup> The cranial bones are thin, and the fontanelles are open. There are almost always other physical anomalies associated with hydrocephaly, such as hare lip, club foot, strabismus, or cleft palate. Few of them ever learn to talk; they are almost always confined to bed, because of their awkward and uncoordinated movements. They are generally affectionate and cheerful, but fall in the lowest group of defectives.<sup>22</sup>

This disorder is probably due to vascular anomalies in the embryonic brain, possibly malformations of structure or tumor growths which obstruct the circulation of cerebrospinal fluid and cause it to accumulate in or around the brain. Other factors, such as congenital syphilis and meningitis may result in the formation of foreign tissue which obstructs the circulation of cerebrospinal fluid. Sometimes this disorder develops after birth, when there are tumors of the third ventricle, arachnoid adhesions, or obstructions of the aqueduct of Sylvius.<sup>23</sup>

Fetal factors are operative from the end of the eighth

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21 Ibid.

22 Thorpe and Katz, The Psychology of Abnormal Behavior, 277.

23 Kanner, Child Psychiatry, 144.

week of pregnancy until labor begins. Most types of intellectual deficiency having their origin in this period of approximately seven months are the result of infections, nutritional deficiencies, or endocrine disturbances.<sup>24</sup>

Probably the best known and most frequently observed of such fetal endocrine disorders is cretinism, or extreme hypothyroidism. The physical characteristics of the cretin are for the most part exaggerations of the symptoms of under secretion of the thyroid gland. These include dry, scant hair, yellowish, dry, pale skin, thick upper eyelids, retarded dentition, with the teeth being irregularly aligned and abnormal in shape. The fingernails and toenails are very thin and brittle, the hands and feet are broad and flat, and the abdomen is bulky and protruding, and there is general motor incoordination. A large percentage of cretins never learn to speak at all, and those who do have very harsh, rasping voices. Cretins never mature sexually and have, therefore, no reproductive powers. Their intelligence varies considerably, but in cases where the deficiency is noticed too late for thyroxin treatments to be effective, victims are usually idiots or imbeciles.<sup>25</sup>

It is thought that cretinism is the result of either complete or partial malfunctioning of the thyroid gland of the

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24 Thorpe and Katz, The Psychology of Abnormal Behavior, 279.

25 Ibid.

fetus. If the diet of the pregnant mother lacks iodine, it may cause underdevelopment of the thyroid, or it may atrophy completely.

Cretinism may be prevented by making certain that there are adequate amounts of iodine in the diets of pregnant women. The only effective treatment of this disorder is the early administration of thyroxin. Even the most severe cases have been known to respond favorably if the treatment is inaugurated during the first year, or at least before the second birthday. If it is delayed until the fifth or sixth year, it is possible that there will be some improvement, but it is usually only in the patient's physical condition, with his mental status remaining constant.

Widely varying degrees of mental deficiency may be the result of congenital syphilitic infection. In such cases, the fetus is affected in utero by the mother's infected blood stream.<sup>26</sup> The disease is not regarded as an inherited one, since the genes are not infected.

This disorder is easily recognized by the following symptoms: the upper teeth are peg-shaped, with notched edges; the corners of the mouth and the nose are frequently scarred, and the nose is saddle-shaped; the corneas of the eyes are inflamed; the skin is dry and shriveled. The neurological findings are quite

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26 Ibid., 283.

consistent; the meninges are inflamed, changes in the pyramidal tract, and atrophy of the cortical tissue.<sup>27</sup>

The prognosis for syphilitic mental deficiency is unfavorable. Since the damage to the brain tissue is permanent, improvement is not to be looked for. In some cases, the administration of anti-syphilitic drugs is indicated, but the majority of cases can only be given custodial care.

A significantly large number of cases of feeble-mindedness are attributable to brain injury. Very often a child presents a syndrome which beyond any doubt calls for a diagnosis of brain injury, and yet even the most careful review of the case history gives no clue to its etiology. In such cases, the separation of causal factors into pre-natal and post-natal seems inadequate. Brain injury may be the consequence of an accident during birth, or the result of later trauma, but the symptoms themselves often fail to reveal any clue as to when the damage took place. In such cases the knowledge that brain injury is a possibility gives more weight to clinical signs which might otherwise be considered insignificant.

Injury to the brain of the fetus may result from any accident sustained by the mother during pregnancy, especially those involving damage to the abdomen. There is some evidence to support the theory that if the mother suffers from any infectious

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27 Ibid.

disease, particularly measles, during pregnancy, cortical tissue of the fetus may be damaged. Damage is also known to be consequent upon X-ray treatments of the pregnant mother, serious heart or kidney diseases, serious intoxications, and extreme vitamin deficiencies. It is possible that some of these factors may produce malformations and degeneration of the developing brain, rather than actual injury.<sup>28</sup>

Possible intranatal factors in the production of brain damage include: premature birth, Caesarean birth, prolonged pregnancy, pelvic malformation, antepartum hemorrhage, anomalies in presentation, twisting of the umbilical cord, the use of forceps, and improper use of anesthetic or drugs.

Postnatal factors include infectious disease during the first few months, especially whooping cough, measles, and scarlet fever; encephalitis and meningitis; and trauma to the head, such as falls or blows resulting in concussions or brain damage.

The factors which are operative during the intranatal period more frequently endanger first born than later born children. And the second born of twins is more liable to birth trauma than the first. Very often these injuries take the form of brain hemorrhages and inflammatory changes in the cerebral tissue. Following birth the infant may appear pallid or blue, sleep for sev-

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28 E. A. Doll, W. M. Phelps, and B. T. Melcher, Mental Deficiency Due to Birth Injuries, New York, 1932, 45-47.

eral days following birth, have difficulty swallowing, or show general listlessness and motor inactivity.

Close observation of clinical manifestations sometimes makes possible a fairly accurate diagnosis of prenatal injuries. If the damage occurs when the fetus is very small and undeveloped, it will generally be extensive and severe, and probably the damage will be to the pyramidal and extrapyramidal system, judging from the gross neurological sequelae. If the accident occurs at the time of birth and is of a slight, noxious nature, it will in all likelihood result in minimal brain lesions which may be detectable immediately after the accident, but whose presence can be deduced later on only by extensive psychological and behavioral observations.

In the absence of gross neurological damage, it is often most difficult to make an accurate diagnosis of brain damage from a medical point of view. Some of the difficulty arises from the fact that the usual techniques employed in the neurological examination of adults may be inadequate when applied to children. Lack of knowledge of developmental neurology has resulted in a failure to correlate our concept of the grown-up organism with that of the growing organism.

The neurologist is often confronted with a single sign which cannot be fitted into a major syndrome but can only be collected as data, which must be interpreted in relation to other data obtained from the history of the child.

This in turn presents another difficulty, inasmuch as the examiner is almost always confronted with an incomplete history. Ordinarily, the patient can contribute nothing to a history and relying on accounts offered by members of the family is generally unsatisfactory, since minor accidents or illnesses which might account for minimal brain injury have usually been forgotten.

The following are considered valuable neurological signs in the diagnosis of brain injury: sluggish pupillary reflex; nystagmus, especially when unilateral; Mayer's and Leri's signs (indicative of pyramidal lesion); positive Babinski reflex; and increase or decrease of deep or cutaneous reflexes, especially when unilateral.<sup>29</sup>

According to Strauss and Lehtinen: "A complete diagnosis of minor brain injury includes the following criteria: (1) a history shows evidence of injury to the brain by trauma or inflammatory processes before, during, or shortly after birth, (2) slight neurological signs are present which indicate a brain lesion, (3) when the psychological disturbance is of such severity that a measurable retardation of intellectual growth can be observed, the immediate family history indicates that the child comes from a normal stock and that he is, in general, the only one of the sibship so afflicted, (4) when no mental retardation exists, the

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<sup>29</sup> Alfred A. Strauss and Laura E. Lehtinen, Psychopathology and Education of the Brain-Injured Child, New York, 1948, 110.



presence of psychological disturbances can be discovered by the use of some of our qualitative tests for perceptual and conceptual disturbances."<sup>30</sup>

As far as clinical observation of behavior in a test situation is concerned, the behavior of the brain injured child can probably be best characterized as hyperactive. He persistently explores his surroundings, is very distractable, usually engages in minor acrobatics, asks irrelevant questions, and perseverates considerably.

Also attributable to traumatic brain damage is epileptic mental deficiency, which is characterized by periodic loss of consciousness accompanied by convulsions. The epileptic is frequently below normal intellectually, and when epilepsy and mental deficiency exist in the same person, it is referred to as epileptic mental deficiency. The epileptic syndrome includes an aura, sometimes in the nature of a momentary premonition of a seizure; loss of consciousness, tonic and clonic convulsions, frothing at the mouth, biting of the tongue, and amnesia for the seizures. The same traumatizing forces which are operative at birth are believed to account for both the epilepsy and the mental deficiency. The severity of epileptic mental deficiency is, therefore, dependent upon the extent of damage sustained at birth.

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30 Ibid., 112.

Lennox and Gibbs,<sup>31</sup> noted for their work in electroencephalography, have presented the theory that cortical dysrhythmia is inheritable, and therefore, a certain proportion of cases of epileptic mental deficiency may be attributed to heredity. However, studies of the dissimilarities of the syndromes of monozygotic twins have cast considerable doubt on this theory.<sup>32</sup>

As in the cases of brain damage discussed previously, the actual trauma may occur shortly following birth, and it may result in either epilepsy, mental deficiency, or both. Where deficiency alone results, the damage to cortical tissue is usually severe and extensive; when epilepsy results, the injury is usually minor and not so extensive. There are cases on record where epilepsy has apparently resulted from only a slight injury to the head.

The medical treatment of epileptic mental deficiency is essentially the same as that for epilepsy. Medication consists of phenobarbital, dilantin, and glutamic acid, all of which are intended to control seizures. In some cases of early inauguration of treatment, administration of glutamic acid has been reported to

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31 W. G. Lennox, E. L. Gibbs, and F. A. Gibbs, "Inheritance of Cerebral Dysrhythmia and Epilepsy," Archives of Neurology and Psychiatry, 44, 1940, 1155-1183.

32 A. J. Rosanoff, L. M. Handy, and I. A. Rosanoff, "Etiology of Epilepsy," Archives of Neurology and Psychiatry, 31, 1934, 1165-1193.

increase level of mental functioning. Treatment of severe cases is restricted to custodial care. In general, the prognosis for epileptic mental deficiency is poor.

Postnatal encephalitic mental deficiency may be caused by any one of a number of infections, such as measles, diphtheria, scarlet fever, smallpox, influenza, mastoiditis, or pneumonia. Mental deficiency is most likely to result when the infection is severe and occurs in early infancy.

While no consistent set of symptoms applies to the varieties of encephalitis resulting from all of these various infections, some of the frequently occurring symptoms include sleep difficulties, especially narcolepsy, behavioral difficulties (usually delinquent and errant behavior), athetoid movements, and tics.

Neurological examinations of encephalitics usually reveal congestion in the brain, hemorrhages in the brain substance, and a flattening of the convolutions of the brain. These apparently result from infectious diseases which inflame the brain substance or cortex, and the brain membranes, or meninges.<sup>33</sup> In cases severe enough to present the symptoms just described, the prognosis of encephalitic mental deficiency is very unpromising.

Another form of mental deficiency is associated with cerebro-spinal meningitis. The symptoms of this highly infectious

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33 G. B. Hassen, Histopathology of the Peripheral and Central Nervous Systems, Baltimore, 1933, 197-202.

and contagious disease including vomiting, fever, stiffness of the neck, headaches, and convulsions. In this disorder there is an inflammation of the membranes of the brain and spinal cord which is caused by an infection by meningococcus. Certain nerve cells may be completely destroyed; thus development is arrested and the individual becomes mentally deficient.<sup>34</sup> No effective treatment or medication of any kind has been found to be effective in meningitic mental deficiency. Nearly all such individuals terminate either on the idiot or the imbecile level.

In recent years a new possible etiological factor in mental deficiency has been discovered. It is the Rh factor in the blood, which derives its name from the rhesus monkey, in which it was first located. The Rh factor is a chemical substance, technically known as agglutinogen, which is found in the red blood cells. Persons having Rh are said to have Rh positive blood; those without it have Rh negative. Difficulties may arise when the mother is Rh negative and the father Rh positive.

It is believed that the mother receives the Rh chemical substance from the blood of the fetus and her own blood builds up antibodies which attack the red blood cells of the fetus containing the Rh factor. It is unlikely that the blood of the mother will contain enough antibodies as to seriously affect the first-born, but the damage may be severe in later-born infants.

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<sup>34</sup> Rosanoff, *Manual of Psychiatry*, 318.

Yannet and Lieberman<sup>35</sup> are credited with much of the early investigation of the Rh factor in mental deficiency. Studying 100 mentally deficient children, they found that approximately half of the mothers had Rh negative blood. Admittedly, this evidence is inconclusive, but it is sufficient to warrant the serious consideration of the Rh factor as a possible etiological factor in the production of feeble-mindedness.

According to Hunt,<sup>36</sup> approximately fifteen per cent of Caucasians are Rh negative, that is, their blood congenitally lacks the Rh factor. Rh negative individuals, and hence Rh negative pregnant women, run the risk of being sensitized, or iso-immunized, to the Rh factor they receive in a transfusion of Rh positive blood. This causes a serious transfusion reaction similar to, although less often fatal than, reactions caused by incompatibility based on the four blood groups.

Hunt cites many case histories which illustrate a second way in which sensitization may take place. The Rh factor in the blood of a mother's own Rh positive fetus somehow gains access to the maternal circulation. Although this sensitization seldom has

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35 H. Yannet and R. Lieberman, "The Rh Factor in the Etiology of Mental Deficiency," American Journal of Mental Deficiency, 49, 1944, 133-137.

36 Arthur B. Hunt, "Rh Factor in Relation to Transfusion of Blood; Importance in Obstetrics," Medical Clinics of North America, 31, 799-802, July, 1947.

a deleterious effect on the mother, infants born in subsequent pregnancies may be adversely affected by congenital hemolytic disease.

Hunt reports that there is no known specific cure or arresting treatment that can be applied during pregnancy to prevent the condition. Death of seriously affected infants occurs in spite of treatment which consists of transfusion of blood.

### The Problems of Mental Retardation

To bring this discussion of the problems of mental deficiency from the realm of the theoretical to the practical considerations involved, it might be well to take into account the incidence of feeble-mindedness in the general population, particularly among children of the age group utilized in this study, as well as the specific problems usually concomitant with this type of deficiency.

It has been estimated that there are approximately 1,500,000 mentally deficient persons in the United States, in addition to a large number manifesting a lesser degree of retardation. Lloyd Yepsen, in discussing the need for organized societies for the aid of retarded children, has stated:

A reasonable estimate would place the number of mentally deficient and retarded children at one and two per cent respectively. This means that of the approximately 3,500,000 children born last year at least 110,000 of these do not have the potentials to compete on equal terms with their normal brothers and sisters. An additional five per cent may be in need of special education making a total of seven

per cent. of the children of school age in need of special care, training or treatment.<sup>37</sup>

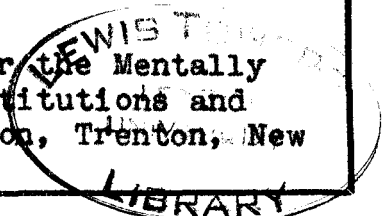
Naturally the incidence of mental deficiency is a highly relative thing, dependent upon the stringency of the criteria employed and upon the age of the group under consideration. Because mental deficiency is frequently accompanied by diverse physical anomalies, an unusually large proportion of the feebleminded die very early in life, so that as chronological age increases, the rate of prevalence decreases. It has been estimated that as high as five per cent of infants under two years of age may be considered mentally defective. During the school years, the proportion drops to about two to three per cent, and by adulthood, the feebleminded constitute about one per cent of the population. Of this population, less than one-tenth are in institutions. Most of the remaining number must be cared for in their own homes.

The home care of mental defectives invariably introduces certain problems with which the ordinary parent is not prepared to cope. These problems spring from the general characteristics of the feebleminded child, which, in certain areas, differ radically from those of his normal brothers and sisters.

The first and most obvious deviation lies in the area of intelligence. If we think of intelligence as the ability to learn

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37 Lloyd N. Yepsen, "Parent Groups for the Mentally Retarded," State of New Jersey Department of Institutions and Agencies, Division of Classification and Education, Trenton, New Jersey, 1949.



useful information and skills, adapt to new problems and conditions of life, profit from past experiences, engage in abstract and creative thinking, employ critical judgment, and exercise foresight, it is immediately obvious that the feebleminded are markedly deficient in all of these attributes. Their learning capacity, particularly for academic subjects such as arithmetic and reading, is so limited as to preclude normal school attendance. While the duller ones are completely excluded on the basis of ineducability, sometimes the brighter ones are placed in special classes. Even here, the curriculum must be slowed down and greatly simplified.

To teach the mentally defective child even the simplest skill, which the normal child picks up without specific teaching, is often a slow and tedious process. Very little of their learning is accomplished through understanding, but rather through the medium of rote memory. This is only accomplished through constant repetition. Parents and teachers are prone to despair of their ever learning when they observe that the same errors are made day after day. They frequently abandon all attempts to teach them such things as writing and simple arithmetic, because they proceed on the assumption that, as in the case of the normal child, once it is learned, it will be retained. But, because these children rely so heavily on rote memory, learned material is so soon lost unless it is constantly reinforced by review. It is in this respect comparable to the conditioned response which is soon lost



unless the stimulus is reinforced from time to time. Discouraged parents and teachers often infer from these observations that these children are totally lacking in intelligence. However, even among the lowest grade defectives, we find some glimmering of intelligence, even though it may be in a rudimentary form.

It has been stated earlier that there is no sharp line of demarcation between the normal and the feebleminded person. The range of human intelligence is continuous. Mentally defective, dull, average, bright, and superior persons are separated from adjoining levels by imperceptible gradations. Looking at these gradations relatively, we see that the feebleminded are as inferior in mental ability to average children as average children are to mentally superior children. This relationship is popularly expressed quantitatively in terms of the concept of IQ.

The intelligence quotient is a measure of brightness obtained by finding the ratio between a person's chronological age and his mental age, as determined by objective tests. The latter is divided by the former and the result multiplied by 100, to avoid the use of decimals. Thus, if a ten year old child had a mental age of ten also, his IQ would be 100, or exactly average. If his mental age were 12, his IQ would be 120, and if his mental age were 8, he would have an IQ of 80.

In the process of standardizing intelligence tests on thousands of children, it has been illustrated that the largest number of children have mental ages coinciding with, or at least

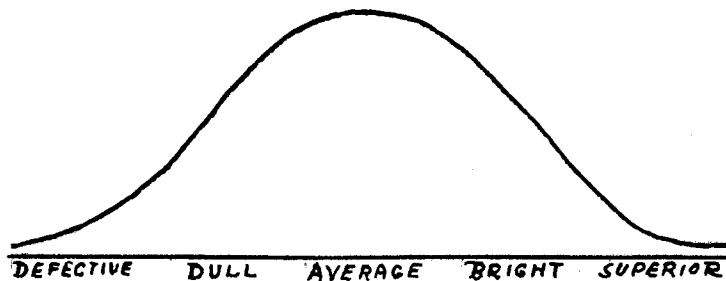


Figure 2. This distribution of intelligence throughout the population shows that the gradation from mental deficiency to superiority is continuous. The largest number fall in the middle, or average range, with the fewest individuals falling at either extreme of the scale.

closely similar to their chronological ages. These children are considered average or statistically normal as far as mental capacity is concerned. The average IQ range is arbitrarily considered as extending from 91 to 110. There are approximately equal numbers of children deviating above and below the norm. For the sake of convenience in classification,<sup>38</sup> persons who are somewhat above average and have IQ's between 111 and 119 are considered bright, those between 120 and 127, superior, and those with IQ's in excess of 128 are called very superior. At the lower extreme of the scale, individuals with IQ's ranging between 80 and 90 are classified as dull normal, those between 66 and 79, borderline, and individuals with IQ's under 65 are classified as mentally defec-

<sup>38</sup> David Wechsler, The Measurement of Adult Intelligence, Baltimore, 1944, 190.

ive. As has been emphasized before, these categories are purely arbitrary and are utilized solely for the sake of convenience.

Second in importance only to their intellectual deficiency is the social insufficiency of the feebleminded. These persons are incapable of adequate self-care, self-support, and self-management in normal society. At almost every stage of their development they require an extraordinary amount of supervision and assistance. Until a much later age, they must be fed, dressed and washed. They show an insensitivity to the common sources of danger, and must be occasionally guarded against accidents. They must be carefully supervised in their play with other children, since they tend to regard other children as playthings, and accordingly treat them roughly. They show little initiative in inaugurating play activities, and must constantly be given suggestions, or told what to do next. Once started upon a course of activity they will often repeat it over and over in a ritualistic fashion, until some variation is introduced by another person. Since they cannot compete on equal terms with children of their own age, they usually show a preference for associations with younger children.

In adulthood, it has been found that less than fifteen per cent of mental defectives are self-supporting. In addition to their economic inadequacy, adult mental defectives are unable to handle their personal and social affairs with ordinary prudence. In the absence of sufficient control, guidance, and supervision.

they are prone to engage in delinquent behavior, especially sexual promiscuity, petty thievery, and destructiveness. This is understandable in view of the fact that they have very vague concepts of right and wrong, and, because they exercise little control over their impulses, their behavior is largely determined by the immediate situation. With adequate supervision it has been found that many of these asocial tendencies can be curbed.

Mental defectives have, for the most part, short attention spans. It is frequently just as difficult to arouse their interest as to hold it. They develop very few real interests, and are easily distracted from those they do have. Hence, they cannot be expected to persist in one line of activity for very long. When instructing them in the ways of performing any task, however simple, directions must be as simple and brief as possible. Their processes of association are few and exceedingly simple, as is demonstrated by their reactions to pictorial material. They show little imagination or creativeness. When a normal child stares off into space and is apparently doing nothing, he is usually day-dreaming. But when the feebleminded child sits idle, there is no evidence that he has even enough creative ability to produce fantasies.

The rate of the development of drives and emotions varies greatly in terms of the extent of the deficiency. Among the lowest grade ailments there is frequently a failure to manifest even the most basic of needs, such as hunger and self-preservation.

Such persons are, naturally, wholly unresponsive to emotional stimuli. They show no fear response in the face of impending disaster, no humor, no affection. In the middle range, the basic physiological drives, with the exception of heterosexuality, are usually well developed, but their affective responses are of a low level. Mongolians, for example, are characterized by an affectionate, outgoing nature, but they are completely lacking in discrimination in their affectionate overtures. Their responses are, for the most part, limited to pleasure, rage, fear, and surprise. The highest grade defective may experience the same range of emotions as do normal persons, but their reactions are lacking in depth and subtlety. They may laugh in situations where others are laughing, but they give no evidence of real humor.

While there are vastly differing personality structures among mental defectives, for the most part individual differences are less pronounced than among the general population. They seldom show characteristics which would justify describing them as dynamic, forceful, charming, or in any way outstanding. They are frequently colorless, apathetic personalities. As a group, they are submissive and easily influenced.

The deviations of the mentally defective are by no means limited to intelligence and social development. Most commonly they suffer from structural anomalies and organic inferiority. They learn to walk and talk much later than do normal children, and are frequently clumsy and awkward in the performance of even

these simple skills. Their speech is often defective and most of them walk with a shuffling gait. Sensory and perceptual discrimination is below par, and visual and auditory defects are common at all levels. Those at the lowest level of deficiency seem to be insensitive to pain and disagreeable odors and tastes.

Mental defectives also fall short of normal performance in manual dexterity and motor coordination in general. In appearance, the great majority are undersized, unhealthy looking, and afflicted with many minor physical defects. They possess far less strength and endurance than normals, and their resistance to disease is markedly low, thus accounting partially for their very high early mortality rate. Organic inferiority is roughly proportional to the degree of mental deficiency.

In the majority of cases we find but one defective child in the family. So, since this child is exceptional, not only with regard to society in general, but also with regard to his own particular family constellation, many problems of adjustment present themselves.

If the feeble-minded child is the first born, the parents commonly experience much anxiety and apprehension over the prospects of having other children, for fear that they too may be abnormal. If there are other normal siblings, the parents' difficulty may be enhanced by the inevitable comparisons between their normal children and the one who can never quite keep up.

One of the most difficult hurdles for the parents of the mentally deficient child is the recognition and acceptance of their child's limitations. Contacts with such parents reveal certain typical, and, in some cases, unfortunate modes of adjusting to this problem.

Probably because of the high degree of ego-involvement, many parents refuse to face the problem realistically. Despite years of medical and psychological consultations, they may go on vainly hoping for their child's return to normality. Because a diagnosis of mental deficiency has a ring of finality to it, many parents prefer to believe that their child is merely slow in developing, that he is emotionally blocked, or that some curable organic difficulty is responsible for his condition. Such autistic thinking permits the delusion that this condition in their child is only temporary. In their anxious insistence that their child is fundamentally normal, they tend to communicate their tension and anxiety to the child, thus further impeding his development.

On the other hand, some parents arrive traumatically at a full realization of their child's condition, with all of its implications. The impact of this discovery may produce an air of martyred resignation, with the parent grimly caring for the child's needs, resentful of the imposition of this unjust burden.

Very often, the tendency toward rejection is productive of guilt feelings in the parents, which are compensated for by

over-indulgence of the child. Their constant attentions and frequent, though superficial, verbalizations of affection toward this child may further complicate the situation by alienating the other siblings. They may come to resent his presence and the need for constantly catering to him; their social contacts are limited because of the ever present necessity of explaining to others about the feeble-minded child. They may avoid the home situation when with their friends in order to avoid the embarrassment of having to explain.

While undesirable, these reactions are understandable in terms of the needs of the parents and siblings. To some degree, most parents tend to live vicariously through their children. There is a deep personal identification with them, their abilities, and their achievements. Largely due to ignorance is the conviction that mental deficiency is a stigma which reflects on the soundness of the family stock. Ill-informed or emotionally unstable parents frequently develop crippling guilt feelings, in the belief that the child's defect is a punishment for their past misdeeds. They may suffer acute embarrassment over the child's erratic behavior in public, and consequently prefer to keep him at home. This, in turn, may produce more resentment over being "tied down."

So involved do the parents become in their own feelings and thwarted needs that they sometimes lose sight of the child's needs. It is reasonable to proceed on the assumption that the



needs of the normal child and those of the exceptional child are comparable. All children, regardless of their mental status, need to feel safe and comfortable and happy. With the proper guidance, most defective children can develop the sense of security so essential to mental health. Feeble-minded children, age for age, may require guidance procedures specific to their particular limitation or difficulty, but the basic principles of relationship are the same as for the guidance of ordinary children. Just as the retarded child is usually less able than the normal child to care for his physical needs, so too we may expect that he will be less capable of satisfying his psychological needs. We may expect, in addition, that his needs may be relatively more or less intense than for ordinary children of his age group. Adequate guidance must take into account all of these differences in selecting procedures whereby, under the most favorable conditions, the child may learn to take over the self-direction and self-satisfaction of his needs, within the limits prescribed by his particular deficiency.

As children reach the age of social awareness, they experience a need for a feeling of belongingness. Parents can assist in establishing this feeling by providing opportunities and encouragement for the child to share in whatever is going on about him. This attitude in turn invites sharing from others, providing a real interaction between child and group.

Because there are so many activities in which the defective child cannot participate, much less achieve, it is most important that he develop a sense of personal importance as a doer, and not just an observer. Proper guidance will assist him in discovering what he can do and what he cannot, encourage him to persist in those areas where it is possible for him to accomplish, and ultimately to accept both his limitations and his abilities.

The learning processes of the exceptional child are frequently so slow as to cause the parents to abandon any attempt to teach him new material. It is important that a child be encouraged to do things for himself, even though he may do them poorly or clumsily, since even small accomplishments give him self-satisfaction and a feeling of worthwhileness. He should be most encouraged to do those things in which he shows some degree of competence.

It will be seen that all guidance principles aim toward the child's happiness. The far-sighted parent will contribute to his child's future happiness by developing his present sense of adequacy. The proper guidance of the mentally defective child pays dividends in several ways: it augments the child's own happiness; this in turn contributes to the happiness of the other siblings, and of the parents.

Adequate reconciliation of parent's needs and the child's needs can often be accomplished in a good home training program. Parents must first realize that their child cannot

develop and learn as fast and as effectively as they would like, but there are some things well within his mental reach. They must realize too, that their child will perform best when acts require no immediate mental effort, but have been committed to habit. They must develop a great deal of patience and follow a certain procedure when attempting to teach him anything. They must be sure they have his attention; they must simplify directions as much as possible, demonstrate what is to be done, and give the child ample opportunity to repeat the act over and over. Confusion must be avoided by establishing a set routine for the child; regularity will give him self-confidence. Help should be given only when he needs it, and if he successfully completes a task, he should be praised. Habit training should include the rudiments of good table manners, dressing himself, toilet training, and habits of personal cleanliness.

A large percentage of mentally deficient children require and benefit from training outside the home. This need presents a multitude of difficulties, depending on the child's level of deficiency. Those at the higher levels may not be recognized as defectives until school age, and may be placed in a regular school system at the age of six. Depending on how apparent their deficiency may be, such children may either be retained in the first grade for two or three years, the parents may be advised to keep them at home until they become more mature, or they may be transferred to a special class for mentally handicapped children.

Unfortunate school experiences tend to increase the frustrations which the child has already experienced at home. In the home situation the parents have often compared their retarded child with his normal siblings, and often, due to their own frustrations, an unfavorable relationship has developed between parents and child. It is quite possible too that the child has been rejected in his neighborhood because he is unable to participate adequately in the neighborhood play of children his own age. The situation just described usually pertains to children in the higher ranges of deficiency, whose deviation from the norm is not immediately apparent.

Defective children at the lower end of the scale are in an even more serious dilemma as far as school training is concerned. With the speech retardation, lack of motor development, and diverse minor physical anomalies frequently accompanying severe retardation, there is no question of regular school placement for these children. They have been excluded from the public school system on the basis of being ineducable; this is usually taken to mean not receptive to academic training. However, these children often manifest a capacity which warrants considering them trainable if not educable. They profit from training in certain basic skills, including self-care, personal hygiene and social interaction. The difficulty then, is the lack of public facilities to provide for such training.

The problem is clear cut. The state assumes responsibility for the education of children with IQ's in excess of fifty.<sup>39</sup> For those falling below that point, parents have the choice of either keeping the child at home and training him as best they can, or institutionalizing him. Many parents are, with good reason, reluctant to institutionalize their child. By keeping him at home, and personally assuming the responsibility for him, they are in effect saving the state the amount of money that would be required to support that child in a state hospital. It would seem reasonable that the state, in recompense for this, would offer the parent of the retarded child at least as much in the way of public educational facilities as they offer the parent of the normal child. To date, legislation providing this aid has been very slow in appearing. Consequently, many private and educational groups have assumed this responsibility. Many reports have appeared in the literature recounting their successes and failures, their aims and objectives. While all of these training programs take different forms, a review of their work will reveal that they all have virtually the same goals.

Because of the intellectual lack in the children for whom these training programs have been specifically created, one

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<sup>39</sup> Illinois Revised Statutes, 1951 Edition, Ch. 122, Section 12-20, Vol. 2, 1058. "Handicapped Children: Authority to Establish Special Educational Facilities: Types of Children Included."

of the chief aims is to compensate by developing to the utmost all of their other potentialities. These other achievements, however, are all largely dependent upon the creation and maintenance of good emotional health. The first step in this direction is the complete and unquestioning acceptance of each child as he is, regardless of his shortcomings. Teachers are selected on the basis of their ability to accept and appreciate each child, to genuinely enjoy their work, and to show real enthusiasm over the child's accomplishments. If the child has come from a restricted home, this permissive atmosphere permits him to fully realize his latent potentialities. It is frequently found that the mentally retarded child is starved for adult attention. This bid for attention and approval is met by providing for a smaller ratio of children to teachers.

The attainment of optimum physical health for such children is also an integral part of such programs. Because of the many physical handicaps among mentally retarded children, it is essential that these training programs maintain an adequate balance between play and rest, as well as proper balance of nutrition through the noon lunch and suggestions to parents.

The children are provided throughout the day with opportunities for growth in self-help in eating, dressing, washing, and playing. They are encouraged to take off and put on their own clothes, and hang up their outdoor clothes on arrival. They may assist one another, but help from a teacher is only given when

the task is too great for the child. They are taught independence in caring for themselves in going to the bathroom, washing their hands, combing their hair and generally improving personal appearance and cleanliness.

When properly motivated, they take an interest in such things as putting their toys away, closing cabinet doors, returning picture books to their proper places on shelves, etc. Helping with clean-up activities helps children in learning to care for themselves.

In teaching these children the rudiments of self-help, it must be borne in mind that because these children are slow learners, the same directions must be repeated patiently over and over again. These children cannot be expected to follow directions in logical order.

Children in this type of program should be offered opportunities to develop their imaginative powers and express their ideas and feelings through free play and the use of a variety of constructive materials. This particular phase must often be exaggerated, since retarded children are so deficient in creative and imaginative expression. The free activities include house play, sand and water play, block play, and the use of such art media as clay and finger paints. The teachers stimulate imagination by daily story telling sessions, after which they have the children relate their daily happenings. Rhythm exercises are used for this purpose as well; children clap their hands or march

around the room in time to music, and are then allowed to introduce their own variations.

The training program contributes most importantly to the social development of the child. Social interaction may be promoted, for example, by encouraging two children to play with blocks in close proximity to each other. Through questions and suggestions by the teacher, they may soon be working on the same project. At meal time the children are taught to pass things to each other. They learn to take turns in certain activities, to help the smaller children and to assist each other in many ways.

It has been noted that the mentally defective child tends to persist in isolated play longer than the normal child. Hence, the teacher must initiate many activities, offer suggestions, and actually participate in the play herself.

The development of motor skills in the training program helps the child to make more effective use of his body. Not only is he furnished with playground equipment such as swings, slides, and trapeze bars, but he is also encouraged to skip, hop, and dance.

The program is also ordained to exploit the intellectual capacities of the retarded child. This includes the development of language, planning ability, and problem solving. The dramatization of fairy tales, with subsequent question and answer sessions helps in this direction. They may also be provided with pets, growing plants, and picture scrapbooks.



Many of these training programs include among their major aims not only the education of the child, but parent education as well. Frequent interviews are held with the parents regarding the problems of their children. Parents are invited to visit the program to discover what is being done and to learn some of the techniques from the teachers. Progress notes are sent to the parents, stressing the child's strong points and his progress. All of these measures are aimed at reducing the parents' anxieties, assisting them in the understanding of their child's limitations, and generally to help them deal more intelligently with the child at home.

Ideally, training programs for mentally deficient children would include facilities for special clinical procedures to be employed with children with individual problems. Even a severely handicapped child may have special potentialities which may be drawn out by special treatment.

This general outline has been intended to present a picture of what may be accomplished in training outside of the home. We now turn to a consideration of studies bearing some resemblance to the present one, which may be expected to either support or negate the premise that the capacities of mentally defective children are modifiable through training.

## CHAPTER II

### REVIEW OF THE RELATED LITERATURE

The present problem centers around the question of whether or not the IQ traditionally conceived of as a constant, is in actuality as plastic and modifiable as other personality traits.

With the introduction of the Binet-Simon scale early in the century, there was a tendency toward unquestioning acceptance of the fact that whatever this scale measured must be constant. What it measured was called intelligence, which was thought of as a native capacity, relatively independent of acquired knowledge. Since the limits of a native capacity are set by heredity, it was assumed that it could operate only within these boundaries set by nature. It was further assumed that multiple measures of intelligence should yield identical or at least very similar scores, and exceptions to this expectation were usually explained in terms of "errors of measurement."

However, a short time after the Stanford revision of the Binet scale had been in general use, docile acceptance of the dictum of IQ constancy began to wane. Users of the test began to notice and in some cases look for, variations in test results following environmental changes. Groups of children were tested and

retested following intervals of varying lengths, so that the scores might be contrasted. And still, even though the germ of skepticism was planted, few authors of that era openly challenged the idea that the IQ is constant. The literature on this question which appeared prior to 1931 has been extensively reviewed and summarized by Foran<sup>1</sup> and Nemzek.<sup>2</sup> Nemzek's work revealed that the studies completed at that time concerning the constancy of the IQ presented a high degree of consistency. He felt that the weight of evidence pointed to constancy, although he pointed out, "As reported in the literature, most of these studies are inadequate because the data are very fragmentary. In most cases the writers have not specified age, grade, or IQ ranges; in many experiments the central tendencies and variabilities of the IQ's and other measures are not indicated. Furthermore, some investigators have not reported the coefficients of correlation between test and retest, the intervals between tests, the changes in IQ's or the PE of measurement."<sup>3</sup>

The literature of the next ten years on this question was reviewed by Thorndike, who states: "In the period now being

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1 T. G. Foran, "The Constancy of the Intelligence Quotient," Catholic University of America Educational Research Bulletin, 4, 1929, 42-46.

2 Claude Nemzek, "The Constancy of the IQ," Psychological Bulletin, 30, 1933, 143-168.

3 Ibid., 168.

studied, the general fact of a rather high positive correlation between test and retest after an interval of time in children of school age seems to be fairly well taken for granted, and relatively few studies were found which were concerned merely with demonstrating this point. Most studies try to push this finding forward in one or another of several directions, of which the following are rather typical: (a) attempts to get retest information on younger and younger children; (b) efforts to get retest data over longer periods of time; (c) efforts to determine the effect upon test constancy of particular types of environmental manipulation."<sup>4</sup>

Thorndike's summary of this work, extending approximately from 1931 to 1939, shows much more active controversy over the question of the constancy of IQ than was seen in the previous period covered by Nemzek.

Pertinent to the present study is the conclusion of Lincoln,<sup>5</sup> that the test scores of superior children tend to decline with retests, and the conclusion of Nemzek,<sup>6</sup> that the most

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4 Robert L. Thorndike, "Constancy of the IQ," Psychological Bulletin, 37, 1940, 167.

5 E. A. Lincoln, "The Stanford-Binet IQ Changes of Superior Children," Journal of Experimental Education, 1, 1933, 287-292.

6 Claude Nemzek, "The Constancy of the IQ's of Gifted Children," Journal of Educational Psychology, 23, 1932, 129-134.

variable IQ's are found among gifted children. Studies of the mentally retarded by Parker<sup>7</sup> and Woodall<sup>8</sup> reveal a progressive decline in the IQ's of these groups. Regarding change in environment, Dawson<sup>9</sup> reports small, but reliable, gains in IQ for a group removed from a slum area to a housing project. Changes in educational environment have been most extensively investigated in the Iowa Studies of Child Welfare, which will be discussed later.

From every side we have been confronted with conflicting evidence regarding the determinants of level of intelligence. But the importance of the problem has not been exaggerated. The issues involved in the nature-nurture controversy are almost of unequalled consequence for educational practice and theory. If the environmentalists' claims are well founded, i.e., if the differences we find in the IQ's of children are largely due to controllable factors of education, training, and environment, then, theoretically, we should be able to eliminate those differences by employing proper techniques of guidance, training, and education. If however, these differences are due, as the hereditarian

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7 H. T. Parker, "Fluctuations in the Intelligence Quotients of Subnormal Children," Journal of Juvenile Research, 18, 1934, 163-168.

8 C. S. Woodall, "Analysis of IQ Variability," American Association for the Study of the Feeble-minded, 36, 1931, 247-262.

9 S. Dawson, "Environmental Influence on Mentality," British Journal of Psychology, 27, 1936, 129-134.

claims, to variations in original endowment, it then becomes the responsibility of guardians and educators to employ those measures of training which will most effectively take into account these native differences.

Before considering the problem more in detail, it is important that we take care not to exaggerate or misinterpret the positions held by these two camps. In the past, adherents of the "nature" theory have been accused of holding to a kind of vacuum mental development which is quite independent of any stimulation from environment. This whole approach to the problem is completely impractical, since such a phenomenon would be impossible. This is an actual problem that faces us--the problem of individuals as they actually are. It is of no consequence to puzzle over the question of what a human being would be like if he were reared in a "nurture-proof" laboratory. Since it is inconceivable that any person can grow and develop without any environmental influence, the question centers around the discovery of whether and to what degree his intelligence can be modified by changing his surroundings.

At the other extreme, champions of the "nurture" theory have been accused of claiming that it is possible to wipe out the whole range of IQ differences among unselected children. While this view may have been held by a few extremists, it certainly cannot be regarded as representative of the environmentalists in

general. The modern contention of this school is that the IQ is not absolutely constant, that it can be influenced by schooling or other environmental factors to a greater or lesser degree. With this statement there could hardly be any quarrel, since even the staunchest hereditarians usually described the IQ as "relatively constant." The principal issue in this controversy then seems to come to a question of degree. Just how broad are the limits set by heredity, if they are set at all? Or on the other hand, just how great a change in IQ can be brought about by environmental manipulation?

In recent years, the most positive stand in favor of environmental determination of IQ has been taken by a group of investigators engaged in studies of child welfare at the University of Iowa. One of the most representative of these studies was co-authored by Skeels, Updegraff, Wellman and Williams, under the title, "A Study of Environmental Stimulation."<sup>10</sup> The purpose of this study was to contrast the development of two groups of orphanage children, one group being intellectually stimulated, the other group receiving no stimulation. The orphanage setting was described as restricted, barren, and altogether unstimulating. All of the children lived in cottages, ate in a common dining hall, and were subjected to similar living conditions. The only

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<sup>10</sup> Harold M. Skeels, Ruth Updegraff, Beth Wellman, and Harold M. Williams, "A Study of Environmental Stimulation," University of Iowa Studies in Child Welfare, 15, 1938, No. 4.

variable introduced was a pre-school project in which half of the children were enrolled. These pre-school children comprised the experimental group, and were paired with a control group consisting of orphanage children who were not enrolled in the pre-school. An attempt was made to equate the two groups on the basis of CA, MA, IQ, sex, nutritional status, and length of residence in the orphanage. There were twenty-one pairs of children at the beginning of the study, but as some children were taken out for placement in foster homes, they were replaced, with an attempt to continually equalize the two groups. As the project was set up then, the only operative variable was to have been the experimental group's six hours of daily school attendance.

In studying the Binet IQ changes, the pre-school children were compared with the control children in regard to change per unit of residence time in the institution. In the pre-school group changes were compared according to amount of pre-school attendance.

The investigators reported distinct differences in pattern of growth between the pre-school and control children. They were grouped in terms of length of residence: One to 199 days, two hundred to 399 days, and four hundred or more days between tests. The children were tested approximately at six month intervals and a child was considered a separate case every time he met the residence requirements. During the initial and shortest period of residence (approximately four months) there were no



marked differences in trend between the pre-school and control children. Subsequently, however, the pre-school and control groups began to diverge, and as time went on the divergence became more accentuated. Over the longest period of residence of approximately twenty months the pre-school children gained 4.6 points in IQ, while the control children lost 4.6 points. The authors reported that they were certain of a true change.

The groups were then subdivided in terms of initial IQ into fifty to seventy-nine initial IQ and eighty or above initial IQ. The control children who had originally tested between fifty and seventy-nine are reported to have made a constant three point gain in IQ over the three residence periods. The pre-school children in the same IQ category made the same gain as the control children over the shortest period of residence (four months), but they made a gain of 7.7 points over the longest residence period (twenty months). The authors claimed that there were ninety-six chances in one hundred that the difference in gains between the pre-school and control children was a significant one. The pre-school children who had initially tested 80 or above remained fairly constant, while the control children lost 6.6 points for forty-one cases over nine months and 16.2 points for twenty-six cases over twenty months. Again the authors were certain of true differences.

The two groups were then broken down into ten point classifications, and comparison on this basis revealed even more

marked divergence, again in favor of the pre-school children. These differences were largely the result of extremely large losses of the control children at the higher initial levels. The reported losses of the control children at initial levels of one hundred or above, ninety to ninety-nine and eighty to eighty-nine were respectively twenty-eight, eighteen, and thirteen points.

One of the authors' most controversial statements in the entire report was: "Regardless of initial classification, all groups of control children headed for a final classification between seventy and seventy-nine IQ. The effect of long residence for control children was a leveling one, tending to bring all children to high grade feeblemindedness or borderline classifications."<sup>11</sup> The investigators observed, however, that the trend for the pre-school group was not so unified, since there was no one level toward which the groups were headed. They found that those who tested average tended to remain constant and the lower levels tended to move upward.

It was found that in the pre-school groups changes were related to number of days of pre-school attendance. Each one hundred days of pre-school attendance resulted in more gain than the previous group. The reported changes were: one to ninety-nine days 1.2 points, one hundred to 199 days 3.6 points, two hundred to 299 days 5.1 points, and three hundred or more days 6.0 points.

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11 Ibid., 49.

They concluded too, that not only actual days of attendance but the distribution of those days throughout the days of nonattendance was important in determining amount of change. Anything less than eighty per cent attendance was found to have no influence in producing gain, even though the actual attendance may have been one hundred fifty to 175 days. Conversely, they found that anything below seventy per cent attendance was likely to produce loss, and if attendance was sixty per cent or less, the loss was pronounced.

Studying the data progressively, the authors found a cumulative effect in pre-school attendance so that greater gain was made per unit of attendance than in the same length of time when it was the child's introduction into pre-school.

From these findings the authors generalized that pre-school under the described conditions made a decidedly effective contribution toward better intellectual development of the child. They interpreted the influence of the pre-school as being largely that of preventing or counteracting losses toward which the extra pre-school environment of these children was constantly pulling. The orphanage pre-school was said to have been successful in supplying intellectual stimulation equal to that supplied to children of these ages living in average homes in average social situations. Having demonstrated by contrast that the control environment was especially unfavorable to good intellectual development,

they concluded that children of average ability may be made feeble-minded.

The social competence of the children in both groups was measured by the use of the Vineland Social Maturity Scale. The pre-school group showed a significant superiority to the control group in social age and social quotient at the first test administration (eight months after the beginning of the project), and they maintained this superiority relatively constantly throughout the experiment. After this first difference was observed, the tendency was in the direction of a gradual loss in social quotient for both the pre-school and the control groups; this loss increased with time and was somewhat greater for the control group.

Commenting on the social significance of the study, the authors concede that the results may seem unbelievably extreme, but nevertheless it must be recognized that the pre-school exerted profound influence on the development of the participating children, not only while they were enrolled in the pre-school, but very possibly for the remainder of their lives. They felt that some of the children whose mentality was raised to the level of normality would certainly have been committed to institutions for the feeble-minded had they been permitted to remain in the intellectually barren orphanage.

Taken as a whole, the results of the study have a bearing on the concept of maturation, if this is thought of as primarily a physiological process little influenced by training. Such a concept does not appear tenable in the light of results obtained here. Not one of the areas studied sup-

ports such a concept. Maturation appears rather to be an unfolding adjusting in tempo and in nature to the demands or opportunities of the situation.

Similarly, in the light of the major shifts in ability and characteristics in almost every area studied, one is given pause on the problem of inheritance of abilities. The limits set by heredity within which changes can take place are assuredly wide. The present study did not begin to tap the limits, since optimum conditions for child development were far from being realized; probably minimum conditions were more closely approximated. The entire study serves rather to give only a hint of the range of responsiveness of the organism to its environment.<sup>12</sup>

In critical examination of the Iowa studies, Quinn McNemar<sup>13</sup> attacks the validity of many procedures employed in the study just cited. First of all, he points out that the attempt to equate the two groups was not successful. The original groups were supposedly equal with respect to CA, MA, and IQ, but McNemar's examination of data given for the total groups reveals that the pre-school group averaged 4.5 IQ points higher on initial tests than the control group.

McNemar lists the following ten factors as variables which would probably be operative in such an experimental situation: (1) age, (2) initial intelligence, (3) orphanage residence, (4) actual number of days of school attendance, (5) days of residence between tests or retest intervals, (6) various examiners, (7) practice effects, (8) Kuhlmann-Binet or Stanford-Binet,

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<sup>12</sup> Ibid., 92.

<sup>13</sup> Quinn McNemar, "A Critical Examination of the University of Iowa Studies of Environmental Influence Upon the IQ," Psychological Bulletin, 37, 1940, 63-92.

(9) possible unintentional coaching in pre-school on material similar to many items in the tests used, and (10) differences in rapport in testing. He questions the validity of the study on the grounds that it is not possible to control more than two or three of these variables at a time.

He charges that the statistical procedures employed violated the most fundamental principles of good sampling. The N's were inflated by including a child as a separate case as many times as he met the requirement of residence interval. He points out that an average change determined in this way was meaningless, since every individual in the universe being sampled did not have an equal chance of being included in the sample. Thus the average was distorted by including a varying number of observations as they passed from individual to individual. He questions the authors avoidance of the obvious method of treating such data. He points out that the effect of pre-school attendance could be easily checked if we proceed on the two assumptions that a) the initial IQ's can be taken as representing the intellectual status of the two groups at the beginning of the experiment, and b) the final IQ's can be taken as reflecting the later intellectual standing of the groups. Then, a straightforward comparison of the mean changes from initial to final IQ's would permit conclusions as to the difference in gain or loss for the two groups. Using this procedure, the sampling evaluation of found differences between the groups would involve nothing more complicated than the

standard errors of the two mean changes. Anticipating the author's objection that such a simple procedure would not take into account progressive changes, McNemar points out that after it has been demonstrated that a real difference in change between the groups has taken place, it would not be too late to examine the progress of the changes.

McNemar places great stress upon lack of rapport as an uncontrolled variable. In citing results, the authors make no mention of shyness, distractibility, negativism, or general lack of cooperation in the testing situations. The authors themselves describe at length various characteristics of these children, pointing out that they were unresponsive, suspicious in their dealings with adults, highly emotional, lacking in confidence, inarticulate, and defiant. But these factors are not looked upon as vitiating the results in any way. McNemar points out that this lack of rapport would have existed similarly for both pre-school children and control children at the beginning of the experiment, but that the former group would have become, in all likelihood, much more cooperative as a result of their experience in the pre-school. He maintains that this factor alone might well explain any divergencies observed in the final testing.

McNemar further objects to the authors' ignorance of the principle of regression in the analysis of their results. Their contention that all the control children headed for a final classification of seventy to seventy-nine IQ, and that the effect of

long residence was a leveling one, would be exploded, he points out, if they took into account the variability of the groups on the final tests as compared with that for the initial tests.

This critic also maintains that examination of the original data on an individual basis shows that the greatest individual gains took place not in the pre-school but in the control group. Furthermore, the control children showing the greatest losses were tested initially as less than twenty months of age. McNemar feels that some consideration should have been given to the question of the comparability of measures of intelligence at age eighteen months with such measures at age four.

In concluding his comments, McNemar states:

In the first place, there is not a single finding in regard to the influence of pre-school upon mental development which could not be explained on the basis of rapport. In the second place, a critical study of the statistical jugglery reveals that differences in rapport need only be invoked to explain slight, statistically insignificant findings. And finally, the authors are guilty of continually playing up unreliable differences and ignoring not only alternative explanations, but also those parts of their data which do not fit with the environmental hypothesis.<sup>14</sup>

Also representative of the Iowa work is a study by Marie Skodak,<sup>15</sup> the purpose of which was to investigate the mental development of children placed in foster homes, and the relationship between the mental development of the child and the various

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14 Ibid., 130.

15 Marie Skodak, "Children in Foster Homes," University of Iowa Studies in Child Welfare, 16, 1939, 1-135.



factors characterizing the true and foster parents and the child's own early development.

Used as subjects were two groups of children from true-family backgrounds evaluated as inferior in educational achievement, occupational level, intelligence, and socio-economic status, who were placed in foster homes evaluated as above average and superior in these characteristics. The first group of children were placed in the foster homes in early infancy, thereby experiencing essentially none of the true-family environment. The children in the second group were placed between the ages of two and five and a half years, and had therefore, lived for varying periods of time in unfavorable environments prior to placement in the foster homes. The 154 children in group one were given two or more intelligence tests after a residence of at least one year in the foster home and at intervals of at least one year. The second group consisted of sixty-five children between two and five and a half years, who came from more inferior true-family backgrounds than the children placed at younger ages and were placed in foster homes somewhat less superior than those of the younger group. Intelligence tests were given just prior to placement and again after a period of one to three years residence in the improved environment of the foster homes. In both groups the 1922 Kuhlmann was used with children under three and a half years of age and the 1916 Stanford with those older.

Considering first the changes in the 0 to six month group, the author concluded that the mental level of the foster children on first examination was above the average of the general population and above the level of expectation judging from the data available from the true families. When they were re-examined, a small decrease in mean IQ occurred, but their mental level still remained above the mean for the population as a whole and higher than was expected from the level of the true parents.

Skodak observed that at one year of age the differences in mental levels of the children on the basis of the occupational classifications of the foster parents were negligible, but at older ages they were marked. She found that the children in homes in the three upper occupational classifications were consistently above the mean of the total group, while the children in homes in the four lower occupational categories were consistently below the mean for the total group.

Relationships between the children's mental development and the education of both true and foster parents expressed in terms of coefficients of correlation rose from zero on the first examination to values of .16 and .38 on last examination. A correlation of .49 was found between children's IQ and a measure of the home environment at the older pre-school ages.

Skodak observed too, that children whose true fathers came from the lowest occupational classification or whose true-family background was extremely poor with one parent known to be

mentally defective, showed the same pattern of mental development as that of the total group of foster children. These children placed in foster homes superior to the average of the total group were above the total group in mean IQ and those placed in foster homes inferior to the average of the total group were inferior to the total group in mental development. She points out that all children placed in similar homes and examined at the same mean age showed the same pattern of mental development regardless of true-family background. She concludes that the final status of the child was related to factors characterizing the foster parents, and that those initially most extreme experienced the greatest changes. Those initially below 110 tended to gain as a group, while those above 110 tended to lose as a group.

With regard to the second group of children placed between two and five and a half years, Skodak concluded that there was no relationship between the intelligence of the children and the objective measures of the level of true-parent ability. Further, children placed at these ages tended to gain in mean IQ with change to improved environmental conditions and continued to gain with cumulative residence in the foster environment over the period of time covered by the study.

It was observed that children placed in foster homes of all occupational levels gained in mean IQ, but that the least gains were made by children in farming homes. The children initially lowest in mental level gained the most, while those initial-

ly highest gained least and tended to remain at their initial level. Within this range, age at placement seemed to have no relation to change in IQ.

In discussing the social implications of these findings, Skodak points out that her study shows that intelligence as commonly defined is much more responsive to environmental changes than previously had been conceived. She believes too, that giving the foster parents systematic training or instruction in techniques of child care which appear to be stimulating to mental development would further enhance the results of such a project.

Even though previous researches have reported rather high relationships between the intelligence of own parents and older own children, Skodak believes that the similarity is largely the result of environmental impacts on the child, the environment being determined and governed by the parents. She concludes from her study that it is the home rather than the child's true-family background which for practical purposes sets the limits of his mental development.

Indications from studies of the changes in mental development with changes in environment, are that if there is an hereditary constitutional factor which sets the limits of mental development, these limits are extremely broad. Within these, environmental factors can operate to produce changes which for ordinary purposes may represent a shift from one extreme to another of the present distribution of intelligence among children.<sup>16</sup>

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16 Ibid., 89.

In his critique of the Iowa Studies previously cited, McNemar also scrutinizes Skodak's findings. He questions her classification of the true parents as inferior to the general population. For the true mothers, a mean of IQ of 87.7 was found by using a chronological age divisor of sixteen. The mean would have been 93.5 had a CA of fifteen been used. The results may also have been spuriously low because of the use of different testers, the use of the Stanford Binet in both the complete and abbreviated form, the fact that some of the mothers were tested during a period of emotional stress, after the birth of an illegitimate child.

Since not all of the true fathers were available for testing, their intellectual level as a group was partially inferred from their occupational level as compared with that of the general population. This information was sketchy, at best, since, as McNemar points out, such data were not available for a large number of the group, many of them were quite young, and some, classified as students, had obviously not yet attained their expected occupational status.

As for their educational achievement, the mean grade finished by the eighty-eight known true fathers was 10.2. On the basis of information supplied by the United States Department of Education, McNemar questions using this data as proof of the fact that this group was subaverage. Since the median education of the population as a whole was, for the year in which the study was made, somewhere between elementary school completion and ninth

grade, it is possible that the members of this group were actually superior. From these facts and from the many gaps in the data supplied by Skodak, McNemar was led to believe that the true fathers were probably above average, and the true mothers at least average.

Secondly, McNemar calls the author's attention to the fact that at the age when the foster children were first tested, the average score on the Kuhlmann is 115. That test yielded an average score of 119 for the children in Skodak's study. At the age when they were tested the second time, Goodenough finds an average of 105, while Kuhlmann gives an average of 107. The foster children averaged 108 on the second testing. In view of these figures, it is possible that the foster children did not really score in excess of the average.

On these points, McNemar concludes:

Thus, when we consider the intellectual background of the known true parents, the possible level of the unknown parents, and the failure of the children to exceed appreciably the averages found for more nearly unselected children, we are forced to conclude that the intellectual level of the children is not above that to be expected from their parentage.<sup>17</sup>

In addition to his criticisms of these major findings, McNemar also takes exception to Skodak's procedure in treating the data. He objects to her indiscriminate mixing of Kuhlmann

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<sup>17</sup> McNemar, "A Critical Examination of the University of Iowa Studies of Environmental Influences Upon the IQ," Psychological Bulletin, 37, 76.

and Stanford-Binet results. Furthermore, he points out, throughout the entire discussion, the characterization of the true parents is made to sound as if information were available on all of them. It is also demonstrated that the difference between means on first and second tests, called "slight" by Skodak, is actually significant when computed according to correct statistical procedure. The author also ignores the known fact of the unreliability of intelligence test results at the age of one year.

In the original study, the correlation of the mid-true parent education with the first test IQ was .08 and with the second test IQ, .33. Skodak described the latter as "substantially" below correlations reported for own-parent child comparisons. Yet, McNemar quotes a number of such correlations as .35, .27, and .48, concluding with the statement: "Perhaps the hereditarian could here rescue something from Skodak's study which might tend to support his hypotheses."<sup>18</sup>

Another paper from the Iowa series evaluated by McNemar is Wellman's study of the effect of pre-school attendance on the Merrill-Palmer and Stanford-Binet IQ's of children.<sup>19</sup> Analyzing the data in several different ways, Wellman concludes that over

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<sup>18</sup> Ibid., 77.

<sup>19</sup> Beth L. Wellman, "The Intelligence of Preschool Children as Measured by the Merrill-Palmer Scale of Performance Tests," University of Iowa Studies in Child Welfare, 15, 1938, No. 3.

the winter months, when the children were enrolled in school, there were significant gains in IQ, as compared with the summer months of nonattendance, when the gains were not significant. The gains over the winter months were approximately twice that of the summer months, and the gains were inversely proportional to initial IQ.

The author explains a certain portion of these changes over the winter months as the result of environmental stimulation. It was felt that children of average ability found more stimulation in the pre-school environment than in their summer home environments, and responded by making greater gains. The children of the highest levels of ability did not find the pre-school environment sufficiently challenging to maintain their high level, although they maintained it to a greater degree than when not in the pre-school.

Regarding the Merrill-Palmer scores, there was no tendency for the changes during the winter to be related to the number of days of pre-school attendance between tests. Changes in Binet IQ for the same children over the same period of time showed a slight positive relationship to number of days attendance.

Children attending pre-school for half-day sessions gained more in Merrill-Palmer IQ than children attending all-day sessions. The reverse was true for Binet changes. In general the changes in Merrill-Palmer ability were less clean-cut than in



Binet ability.

According to McNemar, the same statistical errors common to the Iowa studies are inherent in this particular work. The use of an inflated N again violates one of the basic assumptions of sampling. The gains of 9.1 and 3.7 IQ points quoted by Wellman, would have been much less significant, had the actual N's been employed rather than inflated N's.

McNemar discredits this study with: "Thus, it is seen that the author's conclusion regarding the effect of pre-school attendance on Merrill-Palmer IQ's resulted from faulty statistical treatment of the data."<sup>20</sup>

A research project set up in the Chicago Public School system was intended to further investigate the problem of nature-nurture influence. More specifically, Bernardine Schmidt<sup>21</sup> set out to study personal, social, and intellectual changes in feeble-minded children following educational environmental manipulation. Feeble-minded children were placed in a school environment which was planned to decrease nervous tensions, remove emotional blockings, further social interaction, and develop a feeling of per-

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<sup>20</sup> McNemar, "A Critical Examination of the University of Iowa Studies of Environmental Influences Upon the IQ," Psychological Bulletin, 37, 83.

<sup>21</sup> Bernardine G. Schmidt, "Changes in Personal, Social, and Intellectual Behavior of Children Originally Classified as Feeble-minded," Psychological Monographs, 60, 1946, No. 5.

sonal worth and self-confidence. It was Schmidt's purpose to discover whether feebleminded children would change in such an environment, what the nature of the changes would be, to what extent they would occur, whether such changes would persist in post-school years, and in what way changes would differ from those occurring in a similar group of mental defectives who had participated in a different school program.

The children ranged in age from twelve to fourteen years, and in IQ, Schmidt claims, from 27 to 69. The program extended over eight years and was divided into two parts: a three year in-school period while the children were participating in the program, and a five year post-school period following their withdrawal from the special program.

Special classes were set up within the framework of the Chicago Public Schools. Children found to have IQ's below seventy by Bureau of Child Study examiners were referred to these special classes.

The subjects were 254 boys and girls placed in five special centers for the feebleminded. Since original referrals were not always on the basis of retardation, the issue was complicated by the presence of various personality problems. Speech, vision, or hearing handicaps may have spuriously lowered original test scores. Also, in some cases, Schmidt admits, the "feeblemindedness" may have been apparent rather than real. It should be noted too, that there was a two to one ratio of girls to boys, hence the

group may not have been truly representative of the population of feebleminded adolescents, to the extent to which sex differences may have been operating.

The experimental and control groups were equated on the basis of chronological age, initial IQ, number of years of previous school attendance, the socio-economic status of the family, and initial academic achievement.

In all, seven tests were used to evaluate changes. These included tests of intelligence, achievement, adjustment, and social maturity. Suggestions of the authors of each test were followed in selecting the optimum retest interval to insure the absence of practice effects.

At the beginning of the experiment, the composite achievement of the group in reading, arithmetic, and spelling averaged a level equal to that of the lower half of grade one. Their general behavior was described as maladjusted, as they showed marked tendencies toward truancy, disobedience, day-dreaming, negativism, and lying and stealing. As a group they were in low average general health, and two-thirds of them were handicapped by some sensory defect.

Schmidt reports that during their period of participation in the program, improved personal adjustment was evidenced by an increase in the range of their interests, improved personal appearance, and responsibility for grooming. Their social behavior became more mature, and they grew in competency in activities

In which normal children of their ages were expected to participate. In addition, the author claimed gains in IQ from a mean of 52.1 to 71.6 in three years. By the end of the in-school period, she said, a large percentage of the group were classifiable as of borderline intelligence, rather than feebleminded; a smaller number had moved into the group called "dull," and a few were placeable in the low-normal group.

Continuous and consistent IQ gains were also reported for the post-school period, so that by the close of the study, there were none below fifty in IQ and sixty per cent were classified in the normal range (90 to 110 IQ).

According to Schmidt's computations, only 7.2 per cent remained "feebleminded" at the close of the study. Of the 195 retested after six years, 57.2 per cent showed a gain of 30 or more IQ points; 27.1 per cent 40 or more; 7.5 per cent 50 or more. After seven and a half years, of the one hundred retested, 80.7 per cent gained 30 points or more; 59.6 per cent 40 or more; 29.3 per cent 50 points or more. The mean overall gain in IQ for the entire group was 40.7 points at the close of the study.

Schmidt concludes:

On the basis of this study, it can be said that children who were participants in the experimental school program showed desirable and significant change in personal, social, and intellectual behavior, and that these changes were more desirable and of greater degree than were those found in a comparable group coming from a differing school environment. Further, change in intelligence was found to be closely related to change in personal emotional behavior, and that increase in emotional stability was accompanied by increase

in intelligence, as determined by test performance and an evaluation of experiential activities. Conversely, increase in behavioral aberration was accompanied by a loss of intelligence, according to these same criteria. Statistically, a high correlation was found between change in areas of personal behavior and in intelligence.

To the extent that the cases in the study were representative, therefore it can be concluded that a majority of children originally classified as feebleminded can grow to be mentally competent, well adjusted members of a democratic society, if their educational program is so planned to meet their emotional as well as academic needs while in school and to prepare them for social and vocational competency in their post school years.<sup>22</sup>

Because of the unprecedented nature of these extreme findings, much attention was attracted to the study. Two years after its publication, Samuel Kirk, having been denied a request for a copy of Dr. Schmidt's data, proceeded to check the findings against information made available to him by the Chicago Board of Education. Kirk's conclusions, published in the Psychological Bulletin, 1948,<sup>23</sup> disclosed a number of discrepancies in the original study. He found that the data presented by Schmidt did not correspond with the data for special classes in the City of Chicago. The mean IQ for children recommended for special classes in Chicago for the years 1937-1940 was consistently sixty-eight or sixty-nine, whereas Schmidt reported a mean IQ of 52.1 for her

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22 Ibid., 80.

23 Samuel A. Kirk, "An Evaluation of the Study by Bernardine G. Schmidt Entitled 'Changes in Personal, Social, and Intellectual Behavior of Children Originally Classified as Feebleminded,'" Psychological Bulletin, 45, 1948, No. 4.

total group. It was found, too, that approximately fifty per cent of the children recommended for special classes had IQ's above 69. Schmidt did not record one case out of the 254 in her study as having an IQ above 69.

Kirk also found a discrepancy between the beginning date of the experiment and the actual date of the inauguration of the special educational program in the City of Chicago. He questioned the use of the Bernreuter and several other tests with children who were reportedly reading at the first grade level, and points out erroneous statements by the author concerning the IQ range used for referral to special classes in Chicago.

In support of the hereditarian theory were the findings of Alice Leahy<sup>24</sup> who contrasted the comparative strengths of heredity and environment as determinants of intellectual level. In this investigation the problem was approached by a comparison of two groups of children living in approximately identical environments. In one group, the children were unrelated by blood or marriage to the persons shaping their environment; they were adopted children. In the other group, the children were the offspring of the persons shaping their environment. Both heredity and environment were operative, therefore, in the second group, while only environment was operative in the former.

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<sup>24</sup> Alice M. Leahy, "Nature-Nurture and Intelligence," Genetic Psychology Monographs, 17, 1935, 241-308.

One type of analysis employed was the correlation between attributes in the home and test intelligence of the child. It was presumed that the magnitude of the correlation between adopted children and their foster homes would be the function of environment. In the case of parents and their true children, it would be the function of heredity and environment combined.

A second type of analysis was the comparison of mean intelligence with cultural levels. Since the mean intelligence of the two groups of children was almost identical it was supposed that marked contrasts in intelligence under constant environmental conditions would place the burden of causation on heredity.

Leahy reasoned that if random placement of adopted children took place in each social stratum, then variation from the mean intelligence of the group could be assigned to environmental diversity. And since the homes in both groups of children represented an equal spread on the cultural scale from high to low, she assumed that the nurture factor would be equally potent in the determination of final variance of IQ.

It should be noted that the children in Leahy's study were skewed toward a superior level. No children of the idiot or imbecile grades were included.

From analysis of data derived from the procedure just described, Leahy concluded that variation in IQ is accounted for by variation in home environment to the extent of not more than four per cent; ninety-six per cent of the variation is accounted

for by other factors. She found that measurable environment does not shift IQ by more than three to five points above or below the value it would have had under normal environmental conditions. From this it was generalized that the hereditary component in intelligence causes greater variation than does environment. However, variation in the personality traits measured in this study other than that of intelligence appeared to be accounted for less by variation in heredity than by variation in environment.

In an evaluation of Leahy's study, Stoddard<sup>25</sup> points out that the Otis score of the parent and the Stanford-Binet vocabulary of the parent correlated in the .50's with the IQ of own children, while the correlations for the adopted children were in the low .20's. Although Leahy regards these differences as significant, Stoddard believes they may be unimportant in terms of the total control over the factors involved. By way of illustration, he shows that for a correlation above .90 a difference of a few points in the correlation may be meaningful, but for low correlations, the coefficient of alienation is extremely high. On the basis of this, he points out that a correlation of .20 is only a two per cent improvement over guessing, that a correlation of .50 is a thirteen per cent improvement, and that in either case most of the variability between mid-parent and child is unaccounted for.

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<sup>25</sup> George D. Stoddard, The Meaning of Intelligence, New York, 1943, 377.



Stoddard finds it puzzling that Leahy should expect a correlation between the IQ of an adopted child and the abilities of foster parents. This, he feels, is based on an assumption that all children are equal at birth, and that differences arise as a result of the parents ability to provide superior facilities and home practices designed to bring out the full potentialities of the child.

Stoddard concludes with this observation:

Presumably everything can be accounted for by heredity and environment, provided all the factors in the theoretical dichotomy are available for measurement. Yet in the Leahy study "heredity" and "environment," taken together, accounted for less than thirty per cent. It is easy to slip into the error of assuming that the variance unaccounted for should be placed on the side of heredity. For complex measures like intelligence or behavior, no such assumption should be made.<sup>26</sup>

One other study comparable to the present one, in procedure if not in IQ range of the subjects, is reported by Goodenough and Maurer<sup>27</sup> working at the University of Minnesota. The IQ gains of a group of children attending pre-school were compared with those of a comparable group not in attendance.

For eighty-four cases attending one year, the average gain was five IQ points; for fifty-one cases with two years'

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<sup>26</sup> Ibid., 378.

<sup>27</sup> Florence L. Goodenough and Katherine M. Maurer, "The Mental Development of Nursery-School Children Compared with That of Non-Nursery School Children," The Thirty-Ninth Yearbook of the National Society for the Study of Education, 1940, 161-178.

attendance, the average gain was six points, and for thirteen cases with three years' attendance, the gain was six points. However, these gains were not significantly different from those achieved by the control group children who did not attend the nursery school.

These results are of questionable value, in view of the fact that selective factors were operative in both the experimental and control groups. In the experimental group, it was the practice to automatically transfer the children to kindergarten at the age of five, and even earlier if they gave evidence of rapid advancement. In this way, the fastest growing children were screened out of the group, leaving those average and below. In the control group, children were selected on the basis of the socio-economic status of the family, and there was a tendency to eliminate those children who were backward. The combination of these factors largely explains the similarity in the results of the two groups, and lessens the possibility of detecting any real differences resulting from pre-school attendance by the one group.

This review of the literature was not intended to be a comprehensive one. It will be agreed readily by those familiar with the extensiveness of the research in this field that it would require many volumes to accomplish such a task.

Since it was necessary to be highly selective in the choice of studies to be included, the writer made the selections in terms of two considerations. First of all, the included

studies bear a resemblance to the present study in that they all represent investigations of changes in the various capacities of children following environmental change. Secondly, all of them explore, in some fashion, the question of nature versus nurture.

A simple statement of the nature-nurture controversy, together with a succinct answer to it will be found in Jennings:

Which is more important for the characteristics of organisms, heredity or environment? Which is more important for the characteristics of man? Which is more important for the manufacture of automobiles, the materials of which they are made or the method of manufacture? This question is like the other. No single general answer can be given to either. For good results, both fit materials and appropriate treatment of these materials are required; good genes and fit conditions for their development.<sup>28</sup>

What has been the outcome of the innumerable studies aimed at a solution of this problem? It is possible, in reviewing the literature, to detect certain trends. It was pointed out early in this chapter that in deference to the rationale of newly developed intelligence tests, it was initially assumed that the IQ was a constant factor. This assumption gave unquestioning support to the nature theory. Before long, certain experimental findings cast some doubt on this assumption. As a result, it was resolved that the question of determination of IQ should be fully investigated.

For a time it seemed that investigators were being drawn

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<sup>28</sup> H. S. Jennings, The Biological Basis of Human Nature, New York, 1930, 139.

into the drastic error of over-simplification. Two distinct camps were set up, each championing the cause of one of the two factors, heredity or environment, as the primary determinant of intelligence. The fact that each camp questioned, criticized, and discredited the findings of the other only lent impetus to the controversy.

In recent years, the lack of incontestably conclusive results has seemed to lead in the direction of a gradual, almost imperceptible merging of the two viewpoints. Whereas IQ was previously labeled a "constant" which was "genetically determined," it is now more generally regarded as a capacity functioning within broad limits which are set by heredity. Heredity is known as a maker of choices, depending upon environmental stimulations and possibilities, whereas environment may be said to make differences within the limits of potentiality in the organism.

It is possible that the omnipotence previously attributed to heredity and the underplaying of the role of environment resulted from the incompleteness of our knowledge of heredity. When at a loss to explain the causative factors of any phenomenon, there has long been a tendency to resolve the dilemma by chalking it up to heredity. This point is well illustrated by Stoddard's statement:

We have it from Thorndike himself that no environmental impact will make a man out of a chimpanzee; this, I think is well known and hardly within the scope of our immediate endeavors. But from that point onward even the scientific mind is likely to descend into error: that since we cannot

make a chimpanzee into a man, we cannot make a chimpanzee into a better chimpanzee, or a human child into a better man. The platitude has long had preference over the data. Too often it is said, "You cannot make a silk purse out of a sow's ear." Apart from the fact that industrial chemists have succeeded in making a handsome silk purse out of a sow's ear and nothing else, we should question the basic premise as indicated above: we can make a silk purse out of what we thought was a sow's ear.<sup>29</sup>

From the development of this whole issue, something of worth has emerged. Sweeping generalizations and flatly all inclusive statements regarding the causation of such a thing as intelligence tend to stultify our intellectual growth and understanding in that area. Fortunately, research results seem to have paved the way for a trend away from such thinking. There is, in the more recent literature, a noticeable departure from dogmatic statements about the constancy of IQ and the inheritance of intelligence, together with more conservative qualifications when speaking of the influence of environment on mental functioning. On the whole, the tendency is toward a more careful exploration of the meaning of intelligence and the validity of mental testing.

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29 Stoddard, The Meaning of Intelligence, 327.

## CHAPTER III

### EXPERIMENTAL PROCEDURE

It has been noted in an earlier chapter that a large percentage of mentally defective children profit from training outside the home. The most beneficial type of training depends, of course, on the degree of retardation. Suitable provisions have been made for children falling at the upper end of the range of mental deficiency. Such children are often described as "slow learners," but are, nevertheless, considered educable. In terms of IQ, these are usually children ranging between fifty and seventy. Their ability to learn has been amply demonstrated; if the curriculum is properly geared to their level and their speed, and if they are properly motivated, and if learning conditions are optimum, they have been known to meet with a reasonable degree of success in mastering the simple elements of academic learning. Providing such educational facilities for these children has proved to be a good investment. Many who otherwise certainly would have become public charges have been made at least partially self-supporting and personally responsible by virtue of such training during childhood and adolescence. The State has, therefore, assumed the responsibility of providing special schools

and special ungraded classes in the public school system to care for the needs of these children.

A problem long avoided by public authorities is that of the proper training facilities for children having IQ's below fifty. Such individuals are eligible for admission to state institutions for the feebleminded. Needless to say, if all who were eligible were actually to become institutionalized, state facilities would be impossibly overtaxed.

But more important than the fact that the state institutions would be overcrowded and inadequately staffed is the fact that many parents have cogent reasons for wanting to keep their retarded child at home. And just as individual parental tutoring of normal children would be impractical and impossible, so too, it is more impossible for parents to adequately train and effectively exploit the abilities of retarded children. In the first place few parents are familiar with methods and techniques of teaching; secondly, if there are other siblings in the home, the required time cannot be spent with the exceptional child; and thirdly, and perhaps most importantly, emotional involvement usually prevents the parent from effecting a good teacher-pupil relationship with his child.

Because these children with IQ's below fifty have been excluded from the public school system on the basis of being non-educable, it should not be supposed that they are incapable of profiting from teaching. A working knowledge of academic subjects

ordinarily supposes a capacity for understanding. Since children at this lower IQ level rely most heavily on rote memory rather than understanding in their learning processes, it is not to be expected that they will ever acquire a usable knowledge of reading, writing, or arithmetic. But since they will never be in positions where they will have to cope with the public, it is not too important that they learn these subjects. But every individual, regardless of level of mentality, is constantly in a position where it is essential to his well-being that he establish a good, harmonious relationship between himself and his environment.

In helping the severely retarded child toward this adjustment, formal teaching is indispensable. If we consider the factors that make for better adjustment for such individuals, we realize that they all readily lend themselves to the teaching situation. With sufficient time and patience, most defective children can be taught the rudiments of personal hygiene, self help, including dressing and feeding one's self, and basic principles of social interaction. Even though the child may not understand the why or wherefore of certain actions that he is taught, he derives a certain sense of self-satisfaction from being able to engage in the same activities he observes in others. The development of system and regularity in his life, even though it is ritualistic in nature, provides him with a feeling of security. To be able to associate with other retarded children in the learning process gives him a feeling of belongingness which he may never



have experienced before.

So then, in view of his ability to learn simple skills and rudimentary social graces, the retarded child may certainly be regarded as trainable, if not educable.

How can these children be best trained? What media should be adopted as our most effective means of exploiting their abilities? A survey of the ten experimental training programs in operation in the state of Illinois as of March 1, 1951, reveals that play is the medium most frequently employed.<sup>1</sup>

Play is the child's most natural mode of expression and communication. Through play he first establishes a two way relationship between himself and his environment. In other words, his grasp of reality is initially largely dependent upon play. Through this outlet, not only does he acquaint himself with the world about him, but he likewise works through the problems presented to him by reality. In evaluating the role of play in the child's growing up process, Freud has said: "We see children repeat in their play everything which has made a great impression on them in actual life. They thereby abreact the strength of the impression, and, so to say, make themselves masters of the situation."<sup>2</sup>

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1 Personal letter from Miss Jane Bull, Executive Director, Illinois Commission for Handicapped Children, 160 North LaSalle Street, Chicago, Illinois.

2 Sigmund Freud, Collected Papers, Volume 11, London, 1924, 72.

The play school situation is so designed as to offer the child small doses of reality in an emotionally acceptable fashion. It offers the child an opportunity to begin and to continue his exploration of reality, and to master it so far as his abilities permit. It provides a setting for creativeness, which serves to bolster the weak ego structure, as opposed to overwhelming mass impressions, which may be traumatic. Through play, socially unacceptable patterns of behavior can be exchanged for more acceptable and more profitable ones; inhibitions of function can be undone.

The particular difficulties of handicapped children are also demonstrated in their play activities. They must be skillfully guided to a happy medium between the extremes of passive inactivity and unproductive, endlessly repeated, stereotyped activities. It is the job of the play school to provide the tact, patience, and the emotional climate which will encourage the child to sample reality and overcome the crippling limitations imposed by his own inadequacies.

A school designed to meet these needs was set up in Chicago in June of 1950 by a South Side parents' group known as the Retarded Children's Aid. This is a not-for-profit organization, the membership of which consists primarily of parents of retarded children. The aims of this group include: 1) to educate the public and the parent regarding the problems of the mentally retarded; 2) to bring together parents and friends of mentally

retarded as an organization for the purpose of discussing mutual problems and means of fulfilling obligations to the mentally retarded; 3) to devise means of establishing and maintaining recreational and educational facilities for the mentally retarded. Also, to impress upon public officials, the Board of Education, the Welfare Department, and the general public, the urgent need for additional educational facilities for the retarded; 4) to assist in establishing and maintaining homes for dependent retarded children and also for retarded children whose parents, due to sickness or other causes are unable to care for their child; 5) to aid in the development of medical and psychological research on mental retardation; 6) to further the general welfare of the mentally retarded.<sup>3</sup>

The school founded by this group is known as the South Side Special Play School, the constitution of which is explained in detail in Appendix I. Its facilities are intended for children, who, by properly administered psychological examinations, are deemed ineligible for public school admission on the basis of being non-educable. This non-sectarian school accepts children ranging in age between five and fifteen years, with possible exceptions at the upper end of the range. Its aims are stated as: ". . . to train and educate these (mentally retarded) children

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<sup>3</sup> By Laws of the Retarded Children's Aid, Chicago, Illinois, 1950.

by play and hand activities, to develop each child to the fullest extent of his individual capacities."<sup>4</sup>

The first term of the school began with the week of July 10, 1950. The field house and playground facilities of Tuley Park, at 90th and Eberhart Streets, Chicago, were made available by the Chicago Park District. The highest standards of safety, cleanliness, health, and fire prevention were rigidly observed by the school and all its personnel. The staff of the school consisted of a teacher-in-charge, an assistant teacher and four volunteers from the membership. Matters of policy were decided by this staff in consultation with the professional advisory board, composed of professional persons in the fields of group work, medicine, psychiatry, psychology, social service, education and law.

Tuition for the school, including transportation both ways, was set at thirty-five dollars a month. Exceptions were made for families enrolling more than one child, and for families unable to pay. The initial enrollment was fifty children.

The facilities of the Park and the Fieldhouse placed at the disposal of the group included four spacious club rooms, two fully equipped gymnasiums, two playgrounds, a wading pool, sand piles, a specially equipped playground for the younger children, and shady, grassy spots for quiet activities.

When the nature of this proposed new school was publicized, the response of the public was most gratifying. A bus company donated the services of one bus, a church contributed the services of another, a drivers' union provided the services of two union bus drivers, a service station supplied the gas and oil at cost, a dairy company donated milk for the children five days a week and ice-cream twice a week. Fruit juice and cookies were contributed by organizations, by grocery stores, and by individuals. Specialized toys and expensive equipment were donated or purchased at cost. Gifts of money to cover tuition for financially under-privileged children came in large and small amounts. The State Department of Public Welfare provided the salary for the director. The Retarded Children's Aid engaged in various fund raising projects in order to supply additional financial assistance.

The session each day extended from approximately 9:00 A.M. until 1:00 P.M. A few of the children were brought by their parents to the Fieldhouse at Tuley Park; the remainder were picked up by one of two buses, and returned to their homes at the close of the session. In order to reach the park at approximately nine o'clock it was necessary for the buses to begin their pick-ups around 7:00 A.M. This meant that the children living at the greatest distance from the school were on the buses four hours a day. One of the volunteers rode on each bus.

As soon as both buses had arrived the children were served fruit juice and cookies. At 11:30 A.M. they ate the lunches they had brought from home, together with the milk which was provided each day. The sessions were devoted to such varied play activities as: singing games, rhythms, art work, ball games, puzzles, circle games, story telling, and the use of the playground.

The children were divided into five groups: the older girls' group, the older boys' group, and three younger mixed groups. The two older groups tended to remain more or less stable while the younger groups fluctuated depending on the abilities and level of maturity of their members. These groups met in separate clubrooms and engaged in activities selected on the basis of their abilities. There were a few periods, however, when several or all of the groups were together, for example, for early morning group singing, lunch, and wading in the outdoor pool.

Most of the information concerning these children which is pertinent to this study was gleaned from the work done with each child and his parents prior to his admission to the school. Each of the children accepted for the session was seen first at Mercy Free Dispensary, Chicago, at which time he was given a complete physical examination, and individually administered psychological tests. A social worker interviewed each parent, both at the dispensary and in the home, to gather as complete a history as possible. This history includes such information as: nation-

ality, age, employment, religious affiliation, the retarded child's status in the home relative to siblings, his developmental history, his play experience, his predominant characteristics, and what the parents hoped their child would gain from attendance at the play school.

As previously stated, the subjects for this study were children of members of the Retarded Children's Aid, the organization which founded the experimental play school. Initially, the experimental group consisted of fifty children (the entire enrollment for the first session). As the six month experimental period progressed, an enrollment of fifty was maintained. As the attendance of any child in the original group was discontinued, he was replaced by a child from the school's waiting list. For purposes of this study, however, only those children who were in attendance throughout the entire experimental period were considered members of the experimental group.

Withdrawals occurred for a number of reasons. In only two instances were parents requested to withdraw their child, and the reason in both instances was that the child was so immature and incapable of engaging in group activities as to require the constant supervision of one of the staff members. Voluntary withdrawals were attributable to such causes as: prolonged illness of the child, transfer of the child either to an institution or to another type of training program, financial difficulties or lack of transportation (for those living outside of the area covered

by the buses). Throughout the period of the study, twenty-four children of the original group were withdrawn for one of the above reasons or a combination of them. Thus, at the conclusion of the study, the experimental group consisted of twenty-six children, all of whom had been in continued attendance at the play-school throughout the entire period.

Of the twenty-four children who were withdrawn at some time during the experimental period, the individual causative factors may be summarized as follows: early in the school session, four children were transferred to ungraded classes in the public schools. Nine of the group ceased attending school because of illness. Of this group, four returned to school after recovery, but because of the number of days missed, they were not included in the experimental group at the time of retesting. Two withdrawals were occasioned by the parents' decisions to institutionalize the child, two because of lack of transportation, three for financial reasons, and two withdrawals were requested by the school staff for reasons previously stated. Finally, two children were withdrawn at the discretion of the parents. In one case the parents felt that their child was a menace to the others in the group; in the other case, the parents objected to habits of speech and table manners which the child was learning in the school.

Of all the statements volunteered by the parents of these children, only the last case cited suggested withdrawal



because of lack of progress. But even in this case, the parents felt that the child was profiting in some areas, but that the benefits were not outweighed by the undesirable habits he was acquiring.

As stated in the Prospectus of the School,<sup>5</sup> it was completely non-sectarian, showing no discrimination in terms of race, creed, or color. Selective factors were minimal inasmuch as the membership represented all occupational and socio-economic levels.

In many respects the experimental group was truly heterogeneous. The parents of the twenty-six play school children were of fourteen different national extractions, including ten American; eleven Irish; eight German; Italian, Jewish, and Polish, four each; Russian, Servian, and Yugoslavian, two each; and French, English, Bohemian, Scotch, and Swedish, one each.

The parents of these children ranged in age from twenty-five to fifty-nine years, the mean age of the fathers being 46.69 years, the mean age of the mothers 42.34 years.

Surprisingly enough, in this group of twenty-six, both parents were of the same religious denomination in every case. Fourteen of the families, or fifty-four per cent of the group were Catholic, nine families, or thirty-five per cent were Protestant, and three families or eleven per cent were Jewish.

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5 Ibid., 1.

In terms of the five level occupational classification devised by Taussig,<sup>6</sup> the fathers of the experimental children may be classified in this way: professional workers, four, or fifteen per cent of the group; clerical or "white collar" workers, four, or fifteen per cent; skilled laborers, three, or twelve per cent; semi-skilled laborers, eight, or thirty-one per cent; and unskilled laborers, seven or twenty-seven per cent. Though there are representatives of this group in each of the categories, there is a slight loading at the unskilled end of the occupational scale. These distributions are presented graphically in Appendices IV, V, and VI.

Of the twenty-six children enrolled in the Special Play School, twenty-three, or eighty-eight per cent of the group, were living with both natural parents; one child, representing four per cent of the group, lived with foster parents; two or eight per cent were living with divorced mothers. It was reported that the two living with divorced mothers seldom, if ever, saw their fathers, and gave no evidence that they were aware of a lack in their environments. The one child living with foster parents lived with a maternal aunt and uncle, her natural father was deceased, and she saw her mother frequently and related well to her.

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6 F. W. Taussig, Principles of Economics, Volume 11, 4th ed., New York, 1939, 235.

TABLE I

HOME SITUATION OF 26 CHILDREN ENROLLED IN THE  
SOUTH SIDE SPECIAL PLAY SCHOOL

Home Situation	Total	Percentage
Living with Both Natural Parents	23	88
Living with Foster Parents	1	4
Living with Divorced Mother	2	8

The mean number of siblings in the families of the experimental group children was 2.34. The distribution of family sizes for the group is shown in Table II.

TABLE II

NUMBER OF SIBLINGS OF 26 CHILDREN ENROLLED  
IN THE SOUTH SIDE SPECIAL PLAY SCHOOL

Number of Siblings	Total	Percentage
Only child	6	23
1 Sibling	5	19
2 Siblings	5	19
3 Siblings	5	19
4 Siblings	1	4
5 Siblings	0	0
6 Siblings	1	4
7 Siblings	3	12

It will be seen from Table III that sixty-two per cent of the play school children had had no previous training outside the home. Twenty-three per cent had had from one to eight months of training, while fifteen per cent had received formal training of some kind for a period of two years or more. It should be noted that none of the four children in the latter group had had regular public school training. All of them had been enrolled in programs for the feebleminded.

TABLE III

LENGTH OF PREVIOUS SCHOOL ATTENDANCE OF 26 CHILDREN  
ENROLLED IN THE SOUTH SIDE SPECIAL PLAY SCHOOL

Attendance	Total	Percentage
No Previous Training	16	62.0
1 Month	2	7.6
2 Months	1	3.8
3 Months	1	3.8
6 Months	1	3.8
8 Months	1	3.8
2 Years	2	7.6
5 Years	2	7.6

The children ranged in age from five years to eighteen years. Twenty-five out of twenty-six were within the prescribed age limits of the school (five to fifteen), and an exception was

made in the case of one girl who was 17.6 years old at the beginning of the study. The mean age of the boys was nine years, the mean age of the girls 10.9, with a group mean of ten years. There was a perfectly equal distribution of the sexes, since the group consisted of thirteen boys and thirteen girls. The age and sex distribution will be found in Appendix VII.

During the experimental period which extended from July 10, 1950, to February 1, 1951, the total number of days the school was in session was 124. The distribution in Appendix VIII shows the number of sessions actually attended by the play school children. The mean number of days of school attendance for the entire group was 118.23, with a standard deviation of 5.48.

An attempt was made to test the children in approximately the same sequence before and after the experimental period. In this way it was hoped that there would be nearly the same period of time between tests for all children. However, in a number of instances the child was unavailable for testing in his proper turn. Because of illness, or other intervening factors, he had to be tested out of sequence. Thus, in computing the number of days between tests, it was found that at least 175 days had elapsed between test and retest in each case, but the range extends upward to 220 days. The mean number of days between test and retest for the entire group was 192.42 with a standard deviation of 8.14. The exact distribution of cases over the range will be seen in Appendix IX.

The objective measures of growth and change selected for use in this study included the Stanford-Binet Intelligence Scale and the Vineland Social Maturity Scale. The Binet was used because it was deemed the most applicable to the majority of the children in this group. For a small number of subjects it was impossible to secure a basal age even at the two year level. While scores could have been obtained for these children by using the Kuhlman test, it was deemed inadvisable to attempt to treat statistically a mixture of the two types of scores.

Each child was tested in a small examining room where distracting stimuli were kept at a minimum. These rooms were furnished with a table, a desk, and two chairs; there were no wall decorations to draw the child's attention away from the test. The atmosphere was informal, and it was not insisted that the child sit still between tasks. For the smaller children, a low table and a child's chair were provided.

Considering the low level of ability of these children, there was little possibility of fatigue resulting from a lengthy examination. Since they were usually not successful at more than three age levels, the tests were generally completed in thirty to forty minutes. As would be expected, they showed considerably less scatter of abilities than the normal child.

Many of the children were initially timid or withdrawn in the hospital setting. The first task, therefore, was to es-

establish good rapport with them. The early part of the period was spent in playing with the child, showing him toys, and talking to him. If the child was frightened and these approaches failed to put him at ease, the test was postponed until the second visit to the hospital.

The child was encouraged by frequent and generous praise, but no attempt was made to coax responses from him. He was started at a level where he was likely to encounter success (usually the two year level), and the test was continued until a level was reached at which all items were failed.

The tester took into account such factors as the feeble-minded child's characteristically short attention span, his distractability, shyness, and negativism. More than with normals, these children's responses are influenced by poor health, fatigue, hunger, or any variety of physical discomfort. Therefore, wherever possible, and always in the cases of very young children, tests were scheduled for early morning or immediately after the afternoon nap.

Whenever possible, observers were excluded from the testing situation. In a few cases however, the child was very timid or very dependent and became unduly upset at the prospect of entering the examining room alone. In these cases, one parent was permitted to accompany him. The parent was always seated in the background and cautioned not to help the child by rewording questions or suggesting answers.

The standardization of the Binet test was rigidly followed; any concessions made for the child's handicaps, incoordination, or language difficulties would have invalidated the test. In order to secure maximum cooperation, however, the order in which the tests were presented was occasionally varied. This procedure is deemed permissible by Terman and Merrill and does not in any way affect the validity of the test.<sup>7</sup> If a child began to show signs of negativism, a pleasing test was introduced to win his cooperation. The tester also exercised caution to be sure he had the child's interest before any task was presented. In the drawing tasks the child was provided with a thick pencil which proved easier to manipulate.

In recent years the measurement of social maturity has come to be regarded as equal in importance to the measurement of intelligence. Both mental age and social age are invaluable to understanding the individual. Whereas tests that purport to measure intelligence actually measure power to think, to judge, and to reason abstractly, the Vineland scale, used in this study, measures social development in terms of personal independence and responsibility.<sup>8</sup> In infancy and early childhood, social maturity

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7 Lewis Terman and Maud Merrill, Measuring Intelligence, Cambridge, 1937, 56.

8 Edgar A. Doll, "Vineland Social Maturity Scale, Manual of Directions," Educational Test Bureau, Philadelphia, 1947.



is reflected in self-help, at adolescence in self-direction, and in adult life as assumption of responsibility for others. The successive items of this social scale represent progressive maturation in self-help, self-direction, social relations, locomotion, occupation, and communication. The items are divided into age groups representing ever-increasing degrees of social competence. These genetic levels of performance are considered as successive stages of social maturation.

Although the social maturity scale is similar in principle to the Binet scale, it does not require examination of the subject. The method provides instead for the interviewing of a person who is intimately familiar with the subject, who can supply a record of his habitual performances. The final score is calculated from the total number of items successfully performed.

The tester began by questioning the informant (usually the child's mother) well below the anticipated level of habitual performance. While the scale is scored one item at a time, time was saved by grouping together in the interview all of those items pertinent to one area of functioning. The tester was careful to avoid asking the informant if the child could do something; she was asked rather if the child actually did it as a matter of course. If the child lacked opportunity to engage in a particular kind of activity, the tester was careful to avoid accepting the informant's opinion as to whether or not the child was capable of it. If an opinion was offered, the examiner questioned

further to discover the basis for the opinion. This was particularly important with mothers of retarded children, since their emotional involvement sometimes led to an exaggeration, or in some cases, and understatement of the child's abilities.

When the concept of social maturity had been explained to the informant, she was asked for her estimate of the child's level. This estimate was then compared with the child's actual social age as revealed by the test, and also with the informant's estimate at the close of the study.

In addition to these two objective sources of information about the child, the examiner recorded his clinical observations, or his general impression of the child at the first testing session. This included: physical appearance, outstanding characteristics, test behavior, span of attention, sensory defects which may have interfered with test performance and clarity of speech.

During the experimental period the writer visited the play school once a month at which time personal observations were made of individual and group progress. Progress reports were also procured from the school's teachers and volunteers who reported on the introduction of new play activities, transfers of individual children from one group to another, and the content of progress notes sent to parents. These reports were utilized by the writer in evaluating the school curriculum, and by the parents,

especially those having limited contacts with the school in evaluating their child's progress, and any differences that may have existed between his home and school behavior. It was partially on the basis of these reports that the parents formulated their estimates of the child's social age.

The children were retested after approximately six months of play school experience. The same measures were employed: The Stanford-Binet, Vineland Social Maturity Scale, plus the mother's estimates of the children's social ages.

A terminal interview was held with the parents, in which they were invited to express their feelings about the child's progress, or lack of it, over the past six months. Specifically, this interview yielded data on: the child's relations with his parents, with other siblings, with persons outside the home, the regularity of his school attendance, his initial and terminal attitudes toward school attendance, the areas in which he had exhibited any change, the parent's evaluation of the school, and their future plans for the child.

## CHAPTER IV

### RESULTS

As outlined in the preceding chapter, the present problem concerns the investigation of intelligence and social maturity changes in feebleminded children, following six months of play school training. The children in the group ranged from fifty IQ downward. The majority of them had had no previous formal training, hence the play school experience represented an environmental innovation.

The tests used for the determination of Social Age and Intelligence Quotient were the Vineland Social Maturity Scale and the Stanford Binet, Form L. The repeated use of the same form of the Binet was justified by the fact that test and retest were separated by an interval of six months. In discussing practice effects, Terman reports that an increase of two to three IQ points may be expected on the second test, if the first and second tests are separated by an interval of one to a few days. This does not hold true, however, when the tests are separated by a longer interval of time. Further, Terman states<sup>1</sup> that when the same scale is repeated, a small practice effect may persist for a couple of

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<sup>1</sup> Lewis Terman and Maud Merrill, Measuring Intelligence, Cambridge, 1937, 43.

months. In view of the length of time that elapsed between test and retest in this project, it may be concluded that any practice effects were negligible.

The procedure for retesting was so set up as to closely approximate the original testing situation. The children were retested in the hospital setting in which they had originally been tested. In the original testing session, a small portion of the tests had been administered by two testers other than the author. However, the procedure was held carefully constant. In approximately sixty per cent of the cases, the same person administered the tests before and after the experimental period. The tests were administered either on a day when the school session was skipped or on a Saturday morning. In no cases were tests administered after a full school session. Thus fatigue was minimized as an extraneous factor in the testing situation.

As the problem was originally conceived, it was considered plausible to employ the statistical procedure advocated by McNemar in his critique of the Iowa studies.

. . . we can easily check the effect of preschool attendance on mental development providing we are willing to grant two assumptions: (1) that the initial IQ's can be taken as representing the intellectual status of the two groups at the beginning of the experiment, and (2) that the last, or final, IQ's can be taken as reflecting the later intellectual standing of the groups. A straightforward comparison of the mean changes

from initial to final IQ's will permit conclusions as to the difference in gain or loss for the groups.<sup>2</sup>

However, an examination of the data presented in

Table IV will show why such treatment of the data was precluded.

The lack of homogeneity of the data was due to finding seven

kinds of results for intellectual level:

- 1) IQ on initial test; IQ on retest.
- 2) MA on initial test; IQ on retest.
- 3) MA on initial test; MA on retest.
- 4) No score on initial test; MA on retest.
- 5) No score on initial test; no score on retest.
- 6) Month score on initial test; MA on retest.
- 7) Month score on initial test; month score on retest.

The only conditions under which the proposed statistical procedure could be employed would be those in which all scores could be converted to IQ's. In the present study this procedure was precluded because:

- 1) To convert all scores to IQ's one would have to proceed on the assumption that the same ratio maintains between mental age and chronological age below the level of thirty IQ as above that level. In administering this test, if a child successfully completes all of the items at a given age level, we can assume that he is capable of passing tests below that level. However, if he fails to pass the items at the lowest

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<sup>2</sup> McNemar, A Critical Evaluation of the University of Iowa Studies of Environmental Influence Upon the IQ, Psychological Bulletin, 37, 67.

level (two years), we cannot assume that he has developed normally up to that level. It would be necessary to proceed on this premise in order to convert discrete month scores at the two year level to IQ's. Since the truth of this assumption has never been demonstrated, such procedure would be unjustifiable.

2) All of the scores could not be converted to Mental Ages for the same reason. Some of the cases included in the study failed to base at the two year level on the Stanford Binet, hence the test did not yield an MA. The assumption of a point value for test scores below a Mental Age of two years would have been invalid, since the test yielded no information regarding the child's capabilities below that level.

It was possible, however, to convert all of the intelligence test scores to month values, thus permitting a comparison of the means on the test and retest.

In view of the nature of the data yielded by this study, three statistical approaches were deemed feasible. First, all scores were converted to month values, from which the mean gain was computed, together with the significance of that gain. Secondly, those subjects whose tests and retests both yielded IQ scores were treated separately. Again the mean gain was computed, as well as the significance of the gain. Thirdly, the percentage of the entire group showing any gain at all, whether in month scores, mental age, or IQ, was calculated, and the significance of the percentage found.

TABLE IV

INTELLIGENCE TEST SCORES ON TEST AND RETEST FOR  
26 CHILDREN ENROLLED IN THE PLAY SCHOOL

Subject	First Test	Second Test	Gain
A	1 month	2 months	1 month
B	36	45	9
C	35	36	1
D	10 months	12 months	2 months
E	32	33	1
F	No score	No score	0
G	32	35	3
H	No score	No score	0
I	36	36	0
J	No score	3 months	3 months
K	2 yrs. 10 mos.	3 yrs. 6 mos.	8 months
L	32	34	2
M	No score	4 months	4 months
N	46	54	8
O	31	34	3
P	41	48	7
Q	40	40	0
R	No score	4 months	4 months
S	2 yrs. 8 mos.	3 yrs. 6 mos.	10 months
T	33	39	6
U	4 months	9 months	5 months
V	45	45	0
W	38	39	1
X	7 months	7 months	0
Y	40	40	0
Z	30	32	2



Converting all of the subjects' scores on both test and retest to month values, it was found that the mean score on the first test was 28.93 months, S.D. 21.39, while the mean for the retest was 33.81 months with an S.D. of 23.23. The mean gain of 4.88 months was found to be significant beyond the one per cent level of confidence, ( $t = 3.88$ ).<sup>3</sup>

Fifteen of the twenty-six cases in the study scored sufficiently high to permit the computation of an IQ on both test and retest. Separating these cases from the rest, it was found that the mean IQ on the original test was 36.47, S.D. 4.86, and the mean IQ for the test administered at the conclusion of the six months experimental period was 39.33, with an S.D. of 6.06. The mean gain of 2.86 IQ points is significant between the two and five per cent levels of confidence, ( $t = 2.59$ ).

Of the entire group of twenty-six cases, seven remained exactly the same in intelligence test performance between tests one and two. Nineteen cases or seventy-three per cent of the group showed some degree of improvement. Testing this percentage by chi square,<sup>4</sup> it was found to be significant between the two

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3 Computed by the formula  $\sigma M_1 - M_2 = \sqrt{\sigma^2 M_1 + \sigma^2 M_2}$  from Henry E. Garrett, Statistics in Psychology and Education, New York, 1950, 198.

4 Computed by the formula  $x^2 = \sum \left[ \frac{(f_o - f_e)^2}{f_e} \right]$  from Henry E. Garrett, Statistics in Psychology and Education, New York, 1950, 241.

and five per cent levels. Thus in less than five cases out of one hundred would so great a percentage improve by chance.

Table V shows the social ages, stated in tenths of a year, for the play school children before and after the experimental period. The mean social age before the study was 3.9 years, rising to a mean of 4.7 years after six months of play school experience. By computing the subjects' average advance in social age over any six month period prior to the study, it was assumed that they could be expected to gain .195 years during the experimental period. However, the data reveal a mean gain of .87 years, a significantly greater gain than that occurring during any previous period of comparable duration. The gain is significant beyond the one percent level of confidence ( $t = 4.0$ ) When the expected gain of .195 is subtracted from the total gain of .87, the actual gain of .675 is likewise significant at the one per cent level of confidence.

At the conclusion of the study, the parent who had accompanied the child for the first test was again interviewed. In this interview, the parent was asked some direct questions regarding the factual data, such as the number of days the child attended school, his attitude toward school attendance, etc. The rest of the information yielded by this interview was largely spontaneous, with only a minimum of guidance on the part of the interviewer.

TABLE V

SOCIAL AGE TEST AND RETEST SCORES FOR 26 CHILDREN  
IN THE EXPERIMENTAL PLAY SCHOOL

Subject	First Test	Second Test	Gain
A	1.9	3.1	1.2
B	5.6	7.1	1.5
C	3.6	4.3	.7
D	2.7	3.0	.3
E	2.8	4.2	1.4
F	1.9	2.1	.2
G	2.7	4.7	2.0
H	1.6	2.1	.5
I	8.8	9.8	1.0
J	1.8	2.2	.4
K	4.7	4.8	.1
L	7.4	8.0	.6
M	2.2	2.8	.6
N	3.4	5.5	1.1
O	5.2	6.1	.9
P	2.2	3.8	1.6
Q	8.6	9.8	1.2
R	2.2	2.7	.5
S	5.2	6.5	1.3
T	5.2	6.0	.8
U	1.8	2.3	.5
V	3.0	3.9	.9
W	6.6	7.1	.5
X	3.5	4.2	.7
Y	2.1	2.8	.7
Z	4.5	4.8	.3

The parents were asked to describe the child's attitude toward school attendance at the beginning of the session, and his present attitudes. Of the group of twenty-six, sixteen were described by their parents as eager and enthusiastic over the prospect of going to school. After six months of school attendance

their attitudes were still very favorable. Five parents reported that in the beginning the child did not understand what going to school meant, hence he demonstrated neither positive nor negative reactions. At the end of the experimental period however, all five had developed favorable attitudes, and were most eager to go each morning. Two of the children vigorously resisted going to school, but they too became enthusiastic after a short time. Three children were described by their parents as passive in their initial attitudes, and of this group, two soon developed favorable attitudes, while one maintained an air of passivity. In summary then, it may be stated that, regardless of initial attitudes, twenty-five of the twenty-six children in the group demonstrated positive attitudes toward school attendance at the close of the experimental period, one remained passive, and none openly disliked it.

In this interview, parents were lead into a discussion of changes they had observed in the child over the experimental period. Of the group of twenty-six, eleven parents reported that the general level of the child's health had improved over the six months period. The majority of them attributed this to the regularity of the child's routine, a better appetite, and longer and more regular periods of sleep. It is entirely possible that improved physical conditions influenced retest scores. Without exception, every parent interviewed commented spontaneously on the child's improved social contacts. They described this im-

provement in terms of more harmonious relations with other members of the family, with neighbors and relatives, and especially with children their own age. Parents were especially pleased with the fact that the children had learned how to play, no longer became hyperexcited in the presence of other children, and had accepted the idea of sharing toys and play materials with others.

Twenty-one of the group had improved in various areas of self-help. This included progress in toilet training, feeding and dressing themselves, and helping themselves and feeding themselves at the table.

Nineteen of the group had improved in language ability. The parents commented on such things as increase in vocabulary, increased use of phrases and short sentences instead of single words, and better comprehension of the conversation of others. Many parents felt that the child's vocabulary had increased principally as a result of learning songs and nursery rhymes, which was a part of the school curriculum. Seventeen of the total group had acquired specific skills during the play school period. Parents of children who had previously been totally dependent were delighted with the fact that their child could now tie his shoe laces, use scissors, utilize table utensils, make paper chains, paint figures on cardboard, etc.

In discussing the children's improvements in various areas, the parents mentioned, in twelve cases, that since attend-

ing the play school, the child was markedly happier, easier to get along with, and more obedient.

Parents of the older children mentioned in several instances that their child was not only more independent and capable of helping himself, but that he was also developing a tendency to help the younger children and to generally manifest more of an interest in other individuals.

In the course of the first administration of the Vineland Social Maturity Scale, the concept of social age was explained to the parent or guardian who acted as informant. Level of social maturity was contrasted with, and differentiated from mental capacity, and discussed in the light of evidence of self-sufficiency, adequacy in social contacts, resourcefulness, and general ability to cope with the environment. The informant was then asked to state an estimate of the child's social age. The estimate was recorded and contrasted with the child's actual social age as measured by the Vineland Social Maturity Scale.

Five of the twenty-six informants erred in the direction of an underestimate. The twenty-one overestimates ranged between .4 of a year and 3.6 years. The mean error in the first set of estimates was 1.5 years.

When the child was retested after the six months in-school period, the informant was asked for a second estimate of the child's social age. Whereas there had been five under-

estimates on the first test, there was but one on the retest. The twenty-five overestimates showed a smaller margin of error, ranging between .1 of a year and 1.9 years. The mean error on the second estimate was .6 years.

In many instances the second estimate was accompanied by a verbal statement giving evidence of a more realistic evaluation of the child's social adequacy. Following are examples of these statements:

I know now that I was pretty far off on that first guess. He's not nearly as competent as my normal three-year-old, and I don't expect as much from him.

She has improved so much in the play school that I think I could say she's like a five-year-old socially now. But I can see now that she wasn't up to that level six months ago.

As is frequently the case in projects of this kind, it was found that several factors which had initially been regarded as unimportant to the success or failure of the school, or even as possible detriments, in actuality served as unplanned socializing experiences of considerable importance. Outstanding among such factors were the bus ride and the lunches that the children brought from home.

There were two buses in operation each morning, each one providing transportation for approximately twenty-five children. A schedule was arranged whereby each child was picked up at an appointed hour. While none of the children in the group were able to tell time, the mothers reported that they came to know when it was time to go outside to wait for the bus. Prior

to enrollment in the school, many mothers had complained that getting the child dressed and fed each morning was an ordeal which consumed at least two hours. They required constant prodding and encouragement. However, many of these same mothers reported that the child's anticipation of the arrival of the bus had eliminated the problem entirely. Their expectancy seemed to encourage them to observe a morning routine which was less divergent from that of the rest of the family.

Along with the bus driver and the twenty-five children, one mother volunteer rode each bus. These volunteers reported considerable resistance on the part of the children when the program was first begun. Many of them were reluctant to leave their mothers in the morning; many of them cried all the way to school. However, as the strangeness of the situation began to wear off, they entered the bus happily, called the driver by name, and spent the entire trip playing with the other children. Before long, they had learned the names of the other children, and made a game of pointing out certain landmarks along the way. They frequently sang the songs and nursery rhymes they had learned in the school.

The parents were the first to notice the importance which the children attached to the bus ride. When the children spoke of the school, it was almost always in terms of "the bus that takes me to school." The parents reported several incidents which illustrated the children's delight with the bus ride.



Other parents reported that when they would go out for a Sunday afternoon ride, the child enrolled in the play school would often point out "Jimmy lives in that house," or "We turn at this corner to pick up Tommy." The parents were pleased with this new evidence of awareness on the part of the child.

Another socializing factor that was unplanned was the practice of bringing lunches from home, and eating them in a common dining room. Most of the children started out bringing their lunches in paper bags, but since this led to considerable confusion, parents were requested to provide metal lunch boxes with the child's name painted on the cover. These were kept on a table near the entrance to the dining room. Shortly after the beginning of the session, the staff members began to notice that many of the children recognized each box as belonging to a particular child. If one child arrived at the table first at the beginning of the lunch hour, he or she would sort out the boxes, calling out the name of the owner.

For the first week or so of the session, many of the children refused to relinquish their lunches when they arrived in the morning, and would spend the entire morning going from clubroom to gymnasium to playground, clutching their lunches all the while. In keeping with the general air of permissiveness of the school, they were allowed to do this, until they became sufficiently trusting and secure to leave it on the table in the dining room of their own accord.

The mothers commented that the community lunch experience contributed greatly to the child's self-sufficiency at the table, as well as to his vocabulary. The children often traded apples, cookies, etc., and in this way learned the names of many foods. While at the beginning of the session five children had to be fed, at the end of six weeks they were all feeding themselves.

In one respect, this type of school is genuinely unique. The parents of every child in the school are active members of the organization which founded and runs the school. They set its policy, provide for its maintenance; in short, it is their school. Consequently, they have a very real personal interest in the school. Regular monthly meetings of the entire membership are held, at which problems of the school are discussed, progress noted, and persons familiar with the problems of mental deficiency are invited to lecture.

In addition, the parents are free to visit the school at any time, observe the procedure, and confer with the teachers. Regular progress notes are sent to the parents to keep them informed of any changes observed in their child. The mother volunteers who assisted the teachers were also in a position to discuss with other parents the school activities of their child. It was found that the exchange of ideas which took place at the monthly meetings provided a real catharsis for the parents.

The terminal interview with the parents of the play school children revealed an interesting fact. Not only did they recount instances of the child's progress and changes, but most of them spontaneously described their own benefits from the school. Probably much more revealing than a statistical tabulation of their comments would be a presentation of their actual statements. Following are samples of the verbatim comments of some of the parents:

My husband and I no longer feel that we're all alone with the world's worst problem. Since we joined the parent's group and have visited the school, we know that it's a common problem that we can all work through together.

I haven't had such a sense of freedom since Mary was born. I have some time to myself now, and I'm developing new interests.

It's a good feeling to know that we're all part of a program that is doing something to help all retarded children, not just our own. One person can do nothing, but if we all cooperate, I know we can accomplish something for our children.

My husband has been so much more cooperative since our son has been in school. He seems to take more of an interest now.

Sharing our problems with other parents has helped to make my husband and me more tolerant and understanding toward one another. We feel less sorry for ourselves now.

Freedom from the care of our retarded child during the hours she is at school has made me more patient, not only with her, but with the other children and with my husband as well.

My husband has taken a greater interest in our child since he has attended the school. Although he tried never to show it, I know he has always been ashamed of the boy. He never wanted to take him shopping or be seen with him on the street. But now he seems to enjoy his companionship.

We are not so emotional in dealing with our child now. We are able to keep calm and self-controlled, even when he is most difficult to manage.

Jean was always so unpredictable in her behavior that I was ashamed and self-conscious when I took her out on the street. Since she's been going to play school she has lost a lot of her aggressiveness and has become more acceptable socially. Lately I have even taken her on the street-car and she has behaved very well.

Sometimes I believe my husband and I have profited from the school experience even more than our child. We can appreciate him better now, since we're not buried in our own self-pity.

My husband and I are happier for what all this has done for the older children, even more than for ourselves. They are so proud of their brother now and the little things he is able to do. Before, the older ones didn't like to have their friends come to the house, or to ask questions regarding their brother. Now they're inviting them over to see what Phil can do.

The same qualities that have developed in our child are reflected in us. Since he is happier and more contented, we are too.

The hours Billy is at school give him a rest from me, as well as being a life saver for me. We no longer get on each other's nerves. When he returns home we are happy to see one another.

It seems now that we were always pushing our child ahead, forcing him to attempt things for which he did not have the ability. As a result of the play school experience we have learned not to expect so much from him, and as a result we are all more relaxed and happy.

Not being with the child twenty-four hours a day has helped me physically, mentally, and emotionally. I am much more relaxed and have a better outlook on everything.

I don't resent her like I used to. I used to be impatient and short-tempered, but I'm not so much so now. I guess I understand the whole thing much better.

I'm afraid I didn't show him any affection at all at first. I was so taken aback at finding out that he was sub-normal. But now I can give him enough love to make up for all that time.

For a couple of years I couldn't stand the sight of her. I was ashamed, and I cried about it a lot. But I feel quite a bit closer to her now.

I feel so relieved now. Going out was always such an ordeal, because he'd create such an awful fuss. He's not so dependent now. He's always glad to see us get home, but he doesn't fuss when we leave.

In the course of this interview the parents were also asked whether they had formulated any plans for the child with regard to future placement. Out of the group of twenty-six, twenty parents stated that they intended to keep their child in the play school. Two expressed a wish to have their child placed in a "regular" school, one thought placement in a vocational school would be beneficial, and one planned to institutionalize the child.

Comparing these plans with the actual status of the child in each case reveals a considerable degree of insight on the part of the parents. Those who planned on continued play school attendance for their child stated very cogent reasons for their decisions. Some of the following comments are representative:

At last we have found a place where he can progress at his own speed. As long as he continues to make any progress at all we're going to keep him there.

We've finally faced the facts and realize that Barbara isn't ever going to be able to learn very much. But even if she doesn't learn much, if the school makes her happy and easy to get along with, I guess we can't ask for much more.

We plan to keep her in the play school as long as she seems to be benefitting from it . . . even in little ways. We're not looking for miracles any more.

Many of these same parents were quite tentative in their plans when they first enrolled their child in the school. Many were convinced that their child could learn everything that type of school had to offer in a very short time, and then they could move on to more complex things, possibly a regular graded school. As time went on and they became better acquainted with the problems of feeblemindedness, they also became more realistic in their plan-making.

The two parents who desired placement in a "regular" school for their children explained that they had heard of ungraded classes and thought that as a result of the play school training perhaps the child might now handle that type of training. There was evidence of parental insight in these observations, since the two children involved were the two highest in the group, in intelligence and social competence. It is entirely likely that these children might be successful in an ungraded classroom.

The parent who expressed interest in vocational school placement was the mother of a fourteen-year-old girl who was very adept at sewing, bead work, finger painting, and the like. Here again, it was evident that the parent had become sensitive to the child's strong points as well as her weaknesses. Plans for institutionalization were in progress for a six-year-old boy who was one of the lowest in the group, and in whom the play school experience had wrought the least significant changes. The mother

stated quite unemotionally that she had decided that it would be for the better interests of the boy and the rest of the family as well, if he were placed where he could get the constant supervision which he apparently needed.

The parents were also asked, in the course of the terminal interview, for their criticisms and personal evaluations of the play school, what it was accomplishing, and the methods and techniques employed. Seven of the group of twenty-six were in complete agreement with the policies of the school, and felt that as much as possible was being accomplished under optimum conditions. Three parents were of the opinion that things would run more smoothly if there were more teachers and the children could receive even closer supervision. Eight were opposed to the amount of free play that was permitted, and felt that activities should be more rigidly controlled and organized. Three parents stated that although rhythm exercises, singing, and ball games were pleasant pastimes, crafts and vocational training would be more constructive. One parent advocated the introduction of academic subjects into the curriculum; one believed that the sessions were too short, and that more would be accomplished if the children were kept at the school for at least six hours a day; one felt that grouping the children limited their contacts too much; and one objected to the lack of disciplinary action, and felt that the children were "babied" too much.

## CHAPTER V

### SUMMARY AND CONCLUSIONS

The present study has been an investigation of the problem of modifiability versus constancy of certain traits and capacities of feeble-minded children. The subjects included in the study were those falling at the low end of the range of mental deficiency. Inasmuch as all of the subjects were classifiable, legally and psychologically, as feeble-minded, the concept of feeble-mindedness was explored. It was seen that it has been variously conceived as lack of mental capacity, lack of mental capacity complicated by social inadequacy, and as intellectual deficiency together with certain physical anomalies.

Tredgold regarded mental deficiency in a relative sense, in terms of the individual's ability to adapt himself to the normal environment of his fellows. Lewin offers a biological-social interpretation, stressing the number and quality of the individual's tension-systems. The feeble-minded person, according to Lewin, is one who, like the normal child, has few goals and interests, and like the rigid adult, has unyielding boundaries between the tension-systems set up by these interests.

The formulation of a comprehensive theory of feeble-mindedness is probably impossible, in the light of the multitudi-



nous specific-clinical types of defectives. An understanding of the etiology, symptomatology, and prognosis of feeble-mindedness can only be derived from a consideration of the separate classes of ailments. Since a wide variety of types of mental defectives were included in the present study, the causes and consequences of the various broad classes were considered. These included the hereditary, pre-natal, post-natal, and multiple causation types.

It is unlikely that the magnitude of the problems of mental deficiency is appreciated by the general public. Even the extent of the problem in terms of actual numbers of feeble-minded persons is seldom appreciated. Reliable statistics place the number of mental defectives in the United States at two per cent. Of the approximately 3,500,000 children born in the United States last year, at least 110,000 will require the special treatment accorded to the feeble-minded.

The care of mentally defective children introduces specific problems which arise from their general characteristics. Their deficiency in learning capacity often precludes school attendance. They can be taught simple skills, but even here, their learning is accomplished principally through the medium of rote memory, rather than through understanding.

Second to their intellectual inadequacy, the most outstanding characteristic of the feeble-minded is their social insufficiency. They are commonly insensitive to danger, and require an extraordinary amount of supervision and guidance. They show

little initiative in inaugurating new activities, and must be constantly prodded to complete them. In adulthood, less than fifteen per cent of feebleminded persons are self-supporting, and few can be trusted to handle their personal and social affairs with an ordinary amount of prudence. Lacking sufficient control, many of them are prone to engage in delinquent behavior.

They have short attention spans, few interests, simple associative processes, and little imagination. The development of their drives and emotions is usually retarded in proportion to the degree of their deficiency.

In addition to their deviations from the norm in intellectual and social development, mental defectives most commonly suffer from structural anomalies and organic inferiority. They suffer from retarded motor development, defective speech, and sensory and perceptual abnormalities. Their resistance to disease is markedly low, accounting for their very high mortality rate.

The problems arising from the necessity for home care of mental defectives are manifold. Parents find it difficult to accept realistically the permanency of their child's condition. They prefer to believe that he is slow in developing, that he is emotionally blocked, or that some curable organic difficulty is responsible for his condition. Thus, nurturing the idea that he is fundamentally normal, they tend to communicate their tension and anxiety to the child, the more to impede his development.

As a result of such autistic thinking, rejection, subsequent feeling of guilt, and possibly compensatory overindulgence many parents become so involved in their own feelings that they tend to lose sight of the child's needs. In many respects the needs of the defective child are the same as those of the normal child. It has been demonstrated that with the proper guidance, most feebleminded children can develop the sense of security so essential to mental health. They can be helped toward the goal of a feeling of social belongingness, worthwhileness, and status. They need ample encouragement to arrive at the feeling of accomplishment which results from being able to do even small things for themselves.

It is apparent that even under optimum conditions it would be well nigh impossible for the parents of a feebleminded child to satisfy effectively his many needs in a home training program. Although the state provides for the public education of children having IQ's between 50 and 70, those having IQ's below fifty are excluded from the public school system on the basis of being noneducable. Hence, these children at the lower end of the range of mental deficiency are furnished no facilities for training outside the home.

In the past decade, many private and educational groups have sought to remedy this lack by providing training programs of various kinds for seriously retarded children. A review of the various reports of their work published by these groups reveals

that they share common aims, and to a large extent common techniques in achieving these aims.

Training programs for defective children aim principally toward the maximum development of their potentialities. This assumes the complete acceptance of the child, just as he is, regardless of his shortcomings. The program is so set up as to foster optimum physical health, to provide opportunities for growth in self-help in eating, dressing, washing, and playing. They are taught the rudiments of harmonious social-interaction, and encouraged to develop their imaginative and creative powers. Such programs ideally include facilities for special clinical procedures to be employed with children with individual problems. They provide, as well, a wealth of material for medical and psychological research into the problems of mental deficiency.

In essence, the present problem centers around the question of whether or not the IQ, traditionally conceived of as a constant, is in actuality as plastic and modifiable as other personality traits. The relative strengths of heredity and environment as determinants of intelligence have been put to test under the most varied of conditions. The result of these many investigations has been a flood of conflicting evidence regarding the determinants of level of intelligence. A more encouraging result has been the tendency of the two extreme positions, the hereditarian and the environmentalist schools of thought, to converge

upon what might be regarded as a compromise, or a modification or merging of the two positions. The principal issue, which was originally framed in "either . . . or" terms seems to have come to a question of degree. Just how broad are the limits set by heredity, if they are set at all? Or on the other hand, just how great a change in IQ can be brought about by environmental manipulation?

In recent years, the most positive stand in favor of environmental determination of IQ has been taken by a group of investigators engaged in studies of child welfare at the University of Iowa. The numerous studies of Wellman, Skeels, Skodak, and others, were reviewed, together with their critics' evaluations, and contrasted with the hereditarian position taken by such authors as Leahy.

While there is much of value and much to be criticized in all of these studies, the important fact does emerge that the evidence is inconclusive. And in the absence of incontestably certain evidence, we have been forced to modify our thinking and veer away from the over-simplifications which once colored our thinking in this area. There has been, in recent literature, a noticeable departure from dogmatic statements about the constancy of IQ and the inheritance of intelligence, together with more conservative qualifications when speaking of the influence of environment on mental functioning. On the whole, the tendency is toward a more careful exploration of intelligence and the validity

of mental testing.

The present study is concerned with the changes which may occur when a group of feebleminded children are given play school training for a period of six months. More specifically, will this environmental change produce significant changes in intelligence and social maturity in such children?

In lieu of state provisions for the training of retarded children, a Chicago parents' group known as the Retarded Children's Aid organized such a training school in June of 1950. This non-sectarian, non-profit school is known as the South Side Special Play School. Its enrollment at the time of this study was made up of fifty children ranging in age from five to fifteen years. School sessions were held in the field house and playground of Tuley Park, Chicago. Tuition for the school was thirty-five dollars a month per child, and this included bus transportation to and from the school. The facilities at the Park included four clubrooms, two fully equipped gymnasiums, two playgrounds, a wading pool, sandpiles, a specially equipped playground for the younger children, and outdoor play areas for quiet activities.

The session each day extended from approximately 9:00 A.M. until 1:00 P.M. Fruit juice and cookies were served soon after the children arrived in the morning, and at 11:30 A.M. they ate the lunches they had brought from home, and milk, which was provided by the school. The daily sessions were devoted to such varied play activities as: singing games, rhythms, art work, ball

games, puzzles, circle games, story telling, and the use of the playground.

The children were divided into five groups: the older girls' group, the older boys' group, and three younger mixed groups. These groups met in separate clubrooms and engaged in activities selected on the basis of their abilities. There were a few periods when several or all of the groups were together, for example, for early morning group singing, lunch, and wading in the outdoor pool.

Prior to admission to the school, each child was seen at Mercy Free Dispensary, Chicago, at which time he was given a complete physical examination, and individually administered intelligence tests. A social worker interviewed each parent, and obtained a complete history. At the beginning of the study the experimental group consisted of fifty children (the entire enrollment for the first session). As the six month experimental period progressed, an enrollment of fifty was maintained. As the attendance of any child in the original group was discontinued, he was replaced by a child from the school's waiting list. For purposes of this study, though, only those children who were in attendance throughout the entire experimental period were considered members of the experimental group. Thus, at the conclusion of the study, the group consisted of twenty-six children, all of whom had been in continued attendance at the play school throughout the entire period.

Data concerning the personal status, family backgrounds, and home situations of the subjects demonstrates the heterogeneity of the group. There are representatives of fourteen different national backgrounds; the ages of the parents range from twenty-five to fifty-nine years, the mean age of the fathers being 46.69 years, of the mothers 42.34 years. The group was made up of Catholics, Protestants, and Jews, the percentages being fifty-four, thirty-five, and eleven, respectively. The fathers of the play school children represented all occupational levels, from the professions to unskilled labor, with a slight loading at the unskilled end. Eighty-eight per cent of the children were living with both natural parents, eight per cent with divorced mothers, and four per cent with foster parents. The number of siblings in the family groups ranged from one to seven, the mean being 2.34. Sixty-two per cent of the children had had no previous training, twenty-three per cent had had from one to eight months of training, and fifteen per cent had received training for two years or more.

The group consisted of thirteen boys whose mean age was nine years, and thirteen girls whose mean age was 10.9.

During the experimental period the school sessions totaled 124; the mean number of days of school attendance was 118.23, with a standard deviation of 5.48.

The number of days elapsing between test and retest ranged from 175 to 220; the mean interval between tests for the



group was 192.42, the standard deviation 8.14.

The objective measures of growth and change selected for use in this study included the Stanford Binet Intelligence Scale and the Vineland Social Maturity Scale. The Binet was used because it was deemed the most applicable to the majority of the children in this group. For a small number of subjects it was impossible to secure a basal age even at the two year level. While scores could have been obtained for these children by using the Kuhlmann test, it was deemed inadvisable to attempt to treat statistically a mixture of the two types of scores. In addition to the actual measure of the child's social age on the Vineland Scale, an estimate of social age before and after the experimental period was obtained from the child's parent or guardian.

To augment these objective sources of information, the examiner recorded his clinical observations, or his general impressions of the child, made personal observations during monthly visits to the school while it was in session, and obtained progress reports from the teachers and volunteers. A terminal interview was held with the parents, in which they were invited to express their feelings about the child's progress, or lack of it, over the past six months. Specifically, this interview yielded data on: the child's relations with his parents, with other siblings, with persons outside the home, the regularity of his school attendance, his initial and terminal attitudes toward school attendance, the areas in which he had exhibited any change,

the parents' evaluation of the school, and their future plans for the child.

Not all of the intelligence tests yielded IQ's, hence change in intellectual functioning between test and retest was judged by a comparison of the two sets of scores converted to month values. The mean scores for the first and second intelligence tests were 28.93 months and 33.81 months respectively, with standard deviations of 21.37 and 23.21 respectively. The mean gain of 4.88 months was significant beyond the one per cent level of confidence. The influence of practice effect is not known.

Treating separately the fifteen cases achieving IQ scores on both test and retest, it was found that the initial mean IQ was 36.47, while the mean retest IQ was 39.33. The mean gain of 2.86 IQ points was significant between the two and five per cent levels of confidence.

Seventy-three per cent of the group showed some degree of improvement in intelligence. This percentage gain was found to be significant between the two and five per cent levels of confidence. No control group comparisons are available.

The mean social age of these children before the study was 3.9 years, which increased to a mean of 4.7 years at the conclusion of the six months experimental period, showing a mean gain in social age of .8 years. This gain proves statistically significant beyond the one per cent level of confidence. The average advance in social age for any six months period preceding the

study was .195 years. Subtracting this expected gain from the experimental period gain, there remains an actual gain of .605, which is still significant at the one per cent level of confidence.

In the terminal interview, data were procured regarding the qualitative changes in the children as observed by their parents or guardians. With respect to attitudes toward school attendance, parents described initial attitudes ranging from eager enthusiasm to lack of understanding to passivity and resistance. At the conclusion of the study, twenty-five of the twenty-six subjects in the group had favorable attitudes toward school attendance, one remained passive, and none openly disliked it.

Of the twenty-six experimental group parents, eleven reported that their child was in a sounder state of health, twenty-one reported improvement in various areas of self-help, nineteen improved in language ability, seventeen had acquired specific skills, and twelve were described as happier and easier to get along with.

In the course of both test and retest, parents were asked to estimate the child's social age. These estimates were then compared with the child's actual social age as revealed by the Vineland Social Maturity Scale. On the original estimate, five of the twenty-six experimental group informants erred in the direction of an underestimate. The twenty-one overestimates ranged between .4 of a year and 3.6 years. The mean error in the

first set of estimates was 1.5 years.

Whereas there had been five underestimates on the first test, there was but one on the retest. The twenty-five overestimates showed a smaller margin of error, ranging between .1 of a year and 1.9 years. The mean error on the second estimates was .6 years.

It was noted that in the set-up of the school, there were operative a number of factors which served as unplanned socializing experiences. Among these were the bus ride, and the lunches which the children brought from home. Anticipation of the arrival of the bus served in many instances to encourage the child to observe an efficient morning routine. The ride on the bus provided the children with an opportunity to learn each other's names, sing songs they had learned in school, and become more aware of their surroundings.

Bringing lunches from home, and the distribution of them at lunch time each day helped to instill in the children ideas of ownership and respect for each other's property. They also learned the names of many kinds of food from their practice of trading items with one another. Parents were convinced that the lunch period at the school made the children more self-reliant at the table.

In the terminal interview, parents stated their own reactions to, and benefits from the school. They were especially grateful for the opportunity to be part of a group in which all

the parents shared a common problem, and were all working together toward a common solution of it. Since they no longer felt so completely alone with their problems, they were less prone to indulge in self-pity, thereby losing sight of the child's needs.

The school placement of the child provided many mothers with free time in which to develop new interests, thus ridding them of their feeling of resentment against the child for "tying them down." As the child began to acquire more socially acceptable modes of behavior, and to develop small skills, many mothers reported that both they and their husbands were less apprehensive about appearing in public with the child. Going to school tended in many instances to reduce the degree of the child's dependence upon his parents. It helped the parents to better understand the child in the light of his physical and mental limitations.

It was seen also, from the parents' statements of their future plans for the child, that they had developed a much keener insight into the child and his abilities, and were able to view his future much more realistically. There was a remarkable degree of correspondence between the parents' plans and the actual abilities of the child at the conclusion of the experimental period.

Parents were also provided with an opportunity to evaluate and criticize the school program. Approximately one-fourth of the group were in complete agreement with the policies of the school, and wholly satisfied with what had been accomplished with

their child. Three advocated more teachers and closer supervision; eight objected to the amount of free play that was permitted. Three believed that crafts and vocational training should be introduced into the program; one advocated the introduction of academic subjects into the curriculum. One objected to the brevity of the sessions; one to the grouping of the children; and one to the lack of disciplinary action.

The statistical changes, plus the support of qualitative data, principally the parents' reports and the verbal accounts of the children's accomplishments, indicate that the play school experience was a profitable one. The statistical changes however were small, and it should be borne in mind that even the qualitative changes may have been enhanced by the parents enthusiasm and subjective involvement. But in no case was there noted a complete absence of response to play school influences, nor were there any cases of negative progress or regression.

Children who were initially described as "frightened, withdrawn, uncontrollable, uncooperative, pugnacious, and antagonistic," were later described by teachers, volunteers, and parents as "docile, affectionate, obedient, cooperative, and pliable."

Results indicate that the play school experience was a profitable one, not only for the children who actually attended the school, but also for their brothers and sisters, and for their

parents. Sibling relationships improved; parental understanding and acceptance of the children increased; on the whole, the family group was happier and better adjusted.

Through associations with other children of equally limited abilities, the play school children acquired a feeling of belongingness, a feeling of worthwhileness. Their accomplishments were no longer being compared to those of their normal brothers and sisters, but rather to those of other retarded children. In an atmosphere where they were completely accepted, just as they were, with all of their limitations and handicaps, they were able to freely express themselves, to work out their feelings and needs without fear of failure. In short, they were provided with a setting in which they encountered only those restrictions imposed by their own handicaps; a minimal number arose from their environment. In such a setting they were able to adjust better, not only to the world about them, but also to themselves.

Like normal children, these mental defectives have strong needs for adult contacts and especially adult approval. Emotional factors may interfere with the parents' attempts to satisfy these needs; but outside the home these emotional factors are minimized.

Inasmuch as favorable rapport with adults is such an important factor in the level of functioning observed in these children, it is conceivable that changes in rapport which took

place between the beginning and the termination of the study may have influenced changes, at least in so far as the changes are measured by tests. This is a valid objection, and it should be pointed out that rapport did improve over the course of the study. Prior to the study, many of these children had been negatively conditioned against hospitals and hospital personnel. In hopes of finding some remedy for the child's condition, many parents had taken the child from one hospital or clinic to another. As a result of countless examinations and treatments, a large number of the children were fearful when first brought to the hospital for the initial tests. Every precaution was taken to avoid testing a child before good rapport had been established. If the child was shy or fearful, some time was devoted to playing with him, showing him toys, and generally winning his confidence. Despite these measures, however, it is possible that original test scores may have been spuriously low due to lack of rapport.

Over the six months experimental period, the tester made monthly visits to the school, for the purposes of procuring progress reports and making personal observations. During these visits, the children became accustomed to her presence, and by the end of the experimental period, related to her much better than they had initially. Thus, this change in rapport should be taken into account when interpreting test findings.

Furthermore, it is possible that the daily activities engaged in at the school may have borne some resemblance to the



Stanford Binet items, partially accounting for better performance on the retest.

However much these factors may have influenced quantitative changes, the qualitative changes noted at the conclusion of the study are sufficiently marked to justify our attaching some importance to them. It is apparent that the environmental stimulation afforded by the play school in some way produced beneficial changes in these children. It does not follow that the particular methods and techniques employed in this study effected optimum changes, nor that equal or even greater changes could not have been produced in some other way.

The findings strongly suggest, however, that with proper guidance and training, and with advantageous environmental settings, feebleminded children can be brought to a level of functioning higher than that achieved in the home, where no formal training is received.

It has been stated that heredity sets the limits within which intelligence can operate. If this is so, it would seem, in the light of the findings of this study, that at the lower extreme of the intelligence scale, these limits are somewhat narrower than in other ranges of the scale. In other words, the basic capacity of the feebleminded child is not subject to any great change, but within the limits of his capacity it is highly probable that optimum environmental forces can promote maximum functioning.

These findings carry broad implications for educational and training practices for mental defectives. Because these children differ radically in learning capacity, and, more importantly, in what they can learn, they require training programs set up specifically to meet their needs. Other studies have shown that they do not benefit from, indeed, are often harmed by, exposure to educational programs set up with the needs of the normal child in mind. They cannot adapt to a watered-down academic program, since both the subjects and the methods for mastering such subjects are beyond their scope. We must, in the future, not only avoid subjecting these children to the frustrations of inappropriate training programs, we must provide them with special programs so designed as to meet and satisfy their particular needs.

It has been shown that these children profit from homogeneous groupings. Associations with those of comparable abilities tend to augment their feelings of security and status, thus releasing them from the limitations of poor adjustment which prevent their developing to the fullest.

The present study also indicates that the type of program outlined here operates most beneficially when carried over into the home. When parents have access to the school, are free to consult with the teachers and other professional workers and can imitate the techniques employed in the school, they can best provide for the child a smooth continuum, rather than an abrupt switch from one type of environment to another.

The school referred to in this study is organized and operated by a private group. Its facilities are limited, and to the members, these limits seem to become steadily narrower, when, with each passing week, they accumulate more and more applications to enter upon their waiting list. The number of children in need of training of the type described here is tremendous. The number of such training programs available to them is extremely small. It is to be hoped that in time legislators will provide for state aid to such programs. Such aid would inevitably reduce the ever-increasing need for institutional facilities.

In addition, the founding of schools of this type would be a great boon to research. Not only do these programs aid parents in their understanding of the problems of feeblemindedness, but, if properly used, they can aid invaluablely in medical and psychological research, to further adequate treatment of defectives.

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APPENDIX I

SOUTH SIDE SPECIAL PLAY SCHOOL

A Tentative Prospectus

(Fourth Draft)

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1. Purpose - The SOUTH SIDE SPECIAL PLAY SCHOOL is intended to serve children who by properly administered psychological examination are known to be mentally retarded, and who are ineligible at the present time to public school admission. It is a nonsectarian school aimed to train and educate each child to the fullest extent of his individual capacities.

The age range of children eligible for acceptance at this time is 5 to 15 years, with the possible inclusion of 16 year olds who might be able to participate in and benefit from the activities of the younger children. Each child must be able to walk alone. There shall be no preferential treatment because of race, creed, or color.

2. Organization - The School is a private, non-profit project of a voluntary association of South Side (Chicago) parents and friends organized as RETARDED CHILDREN'S AID. This group operates under approved by-laws and elected officers. It is chartered as a not-for-profit corporation under the laws of the State of Illinois.

The School Committee of this association, responsible to its Board of Directors, has been appointed to execute generally approved plans for the School, to employ its personnel, and to conduct all the business for the School.

The Professional Advisory Council has been selected to advise the School Committee through its chairman in the establishment of standards and policy for the school. The Council consists of professional men and women in group work, medicine, psychiatry, psychology, social service, education, law, and related fields.

3. Administration and Staff - The entire personnel of the School, known hereafter as the Staff, is appointed on

the basis of qualifications set up in consultation with the Professional Advisory Council.

The Consultant in Institutional Therapy for the Department of Public Welfare, State of Illinois, will develop standards of qualifications for the teaching staff of the School. She will also prepare a basic plan of activities, staff meetings, in-service training, and parent education groups to be adapted and used by the Teacher-in-Charge. On such matters as she deems it advisable, the Consultant will confer with the Professional Advisory Council.

The Teacher-in-Charge of the School is appointed with the approval of the School Committee and the Board of Directors of RETARDED CHILDREN'S AID. The Teacher is responsible to the Chairman of the School Committee for the program of the School.

Duties of the Teacher-in-Charge include the following:

To discuss professional problems of the School directly with the Consultant in Institutional Therapy, State of Illinois;

To submit regular bi-weekly written reports to the Chairman of the School Committee on the progress, problems, and needs of the School;

To confer with the Chairman on all matters requiring policy decision;

To discuss problems with any member of the Professional Advisory Council as the need arises;

To attend meetings of the Professional Advisory Council upon invitation;

To arrange and conduct Staff meetings;

To organize an in-service training program for the Staff;

To organize parent education groups.

The Teacher-in-Charge will be provided with an Assistant Teacher, plus regularly scheduled volunteer attendants for the physical assistance and supervision of the children.

4. Facilities - The first term of the School is to be eight weeks, beginning with the week of July 10, 1950.

Plans are under way to provide insured transportation by RETARDED CHILDREN'S AID for those children who have no other means of getting to the School.

The facilities of Tuley Park, at 90th and Eberhart Streets, Chicago, are being made available by the Chicago Park District through Mr. John Henry Morris, Park Director, for the site of the school during the summer term of this year.

Under present arrangements each child will be expected to bring his own lunch from home; milk will be provided by the School at cost.

Public liability insurance covering the children while on the grounds of the School is to be provided by RETARDED CHILDREN'S AID.

The highest standards of safety, cleanliness, health, and fire prevention are to be observed rigidly by the school and all its personnel as a minimum requirement.

5. Enrollment - Preliminary enrollment is completed by submitting to the Chairman of the School Committee a school application blank supplied by RETARDED CHILDREN'S AID. Parents or guardians who apply must be members of the association. Applications are considered in the order of their receipt.

Tentatively, the total enrollment is set at fifty children; subsequent applications are being placed on the waiting list.

The parents of children accepted by the School will be assessed a fee to cover the cost of operation.

Transportation for those who require it will be extra. At present the total school and transportation fee is estimated at approximately \$35 a month. Special arrangements may be made for parents who are financially unable to pay the full fee.

6. Affiliation with other Community Agencies: Psychological services - In order to determine the placement of a child into a particular group in the school, it is of utmost importance that there be a uniform record of properly

administered psychological examinations for him. Such a record, in addition to its value for the child, may well be the basis for future research in the field of mental deficiency.

The test is to be administered before the child enters the School, followed by frequent re-examinations to determine the effect of play therapy upon the child's level of social maturity as the School program progresses. This is to be an integral part of the program and the service of the School.

At this time the Psychology Department, Loyola University, has arranged for a doctoral candidate in psychology to establish such a record for each child entering the School for the summer term. It is hoped that this project can be used as the basis for a doctoral dissertation showing the effect of play therapy upon the intellectual capacities of the children.

The Psychologist will attend all meetings of the School Staff, as well as those of the parent education groups.

7. Affiliation with other Community Agencies: Medical Services - Since the purpose of the School involves the development of a well-rounded program of growth for the children, it is necessary that complete physical examinations be administered by a single agency. This is desirable also because it will result in uniform records which are necessary as a factor of control for future study and research.

At this time it has been made possible to arrange with Mercy Free Dispensary to give a complete physical examination to each child accepted by the School before his admittance. This will include a neurological examination, laboratory test, complete blood count, urinalysis, blood Kahn, chest X-ray, and patch test. If there are recommendations for further medical treatment, the information thus obtained by the Clinic can be forwarded to the child's own doctor if desired, or resources at the Clinic may be made available if preferred. This service will be under the direct supervision of the chief of Pediatrics, Mercy Hospital and Stritch School of Medicine, Loyola University. The fee for this complete physical examination will be \$5.00.

8. Home Guidance - In order to develop a better understanding of the child and his relationship to the parents and siblings, a Home Guidance program is essential. It is

most important that the child's activity in the School be interpreted to the parents so that every use can be made in the home of the techniques employed in play therapy in the School. Likewise, the Staff of the School should have as comprehensive as possible an understanding of the position of each child in his home environment. This is properly the responsibility of a guidance person who can discuss these problems with each parent individually. It is essential also that this person be a member of the School Staff.

At this time it has been possible to secure such a guidance person through the School of Social Work, Loyola University, at no expense to the School. This person will be under the direct supervision of the Director of the Mercy Hospital Social Service Department.

The guidance person will promote a better integration of the medical, psychological, educational, and social aspects of the total School program. Frequent consultation between the guidance person and the Teacher-in-Charge will result in a better understanding of the child at home and in school. The guidance person will attend all meetings of the School Staff as well as those of the parent education groups.

APPENDIX II

SOUTH SIDE SPECIAL PLAY SCHOOL APPLICATION BLANK

RETARDED CHILDREN'S AID

(This information will be kept confidential)

Name of both parents \_\_\_\_\_

Address \_\_\_\_\_ Zone \_\_\_\_\_ Phone \_\_\_\_\_

Child's full name \_\_\_\_\_ Sex \_\_\_\_\_

Date of birth \_\_\_\_\_ Is your child at home? \_\_\_\_\_

If attending school give name \_\_\_\_\_

Has the nature of your child's retardation been diagnosed?  
(Brain injury, Mongoloid, Cretinism, etc.) Yes \_\_\_\_\_ No \_\_\_\_\_

Please state the nature of retardation \_\_\_\_\_  
\_\_\_\_\_

Has your child been tested psychologically? \_\_\_\_\_

Give date of last test \_\_\_\_\_ Where \_\_\_\_\_

Can you give your child's approximate mental age? \_\_\_\_\_

Has your child any gross physical defect, as inability to  
walk, talk, hear? Yes \_\_\_\_\_ No \_\_\_\_\_ Describe \_\_\_\_\_  
\_\_\_\_\_

Is your child subject to seizures? Yes \_\_\_\_\_ No \_\_\_\_\_

Is your child subject to emotional upsets? Yes \_\_\_\_\_ No \_\_\_\_\_

Can you arrange transportation? Yes \_\_\_\_\_ No \_\_\_\_\_ How? \_\_\_\_\_

Please check each of the following that your child does.  
(It is not necessary that the child do all these things)

\_\_\_ Talks in short sentences      \_\_\_ Puts on coat or dress  
\_\_\_ Discriminates edible sub-      \_\_\_ Prints simple words  
   stances



- |   |   |
|---|---|
| <input type="checkbox"/> Plays with other children      | <input type="checkbox"/> Uses knife for spreading   |
| <input type="checkbox"/> Walks about unattended         | <input type="checkbox"/> Uses knife for cutting     |
| <input type="checkbox"/> Goes to toilet unattended      | <input type="checkbox"/> Does routine household     |
| <input type="checkbox"/> Removes coat or dress          | <input type="checkbox"/> tasks                      |
| <input type="checkbox"/> Eats with fork                 | <input type="checkbox"/> Dresses self completely    |
| <input type="checkbox"/> Gets drink unassisted          | <input type="checkbox"/> Uses skates, sled, wagon   |
| <input type="checkbox"/> Avoids simple hazards          | <input type="checkbox"/> Dries own hands unassisted |
| <input type="checkbox"/> Uses pencil or crayon          | <input type="checkbox"/> Brushes own hair com-      |
| <input type="checkbox"/> Marks with pencil or<br>crayon | <input type="checkbox"/> pletely                    |

I hereby give permission to the above organization to release any of this information to the Board of Education or any other qualified agency with the understanding that it is to be used for selection only.

Date \_\_\_\_\_ Your signature \_\_\_\_\_

## APPENDIX III

## SCHEDULE

Name \_\_\_\_\_

CA \_\_\_\_\_ MA \_\_\_\_\_ IQ \_\_\_\_\_ SA \_\_\_\_\_

Lives with \_\_\_\_\_ Only child \_\_\_\_\_ O.C. at home \_\_\_\_\_

Siblings at Home \_\_\_\_\_ M \_\_\_\_\_ F \_\_\_\_\_ Older \_\_\_\_\_ Younger \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_Others in Home Relationship \_\_\_\_\_ Age \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Previous School Attendance \_\_\_\_\_ Where \_\_\_\_\_ Duration \_\_\_\_\_

Play Unattended: Own yard \_\_\_\_\_ Neighborhood \_\_\_\_\_ Store \_\_\_\_\_

Medical Diagnosis \_\_\_\_\_  
\_\_\_\_\_Under Medication During Summer Session \_\_\_\_\_ Institutional  
Care \_\_\_\_\_Characteristics as Stated by Parent in Application \_\_\_\_\_  
\_\_\_\_\_What child can do - as stated by parents \_\_\_\_\_  
\_\_\_\_\_What child enjoys - as stated by parents \_\_\_\_\_  
\_\_\_\_\_Child's reaction to discipline - as stated by parents \_\_\_\_\_  
\_\_\_\_\_

Mother: Age \_\_\_\_\_ Type of Employment \_\_\_\_\_

Father: Age \_\_\_\_\_ Type of Employment \_\_\_\_\_

Parents' Outlook \_\_\_\_\_

## APPENDIX IV

NATIONALITY BACKGROUND OF 26 CHILDREN WHO ATTENDED  
THE SOUTH SIDE SPECIAL PLAY SCHOOL

Nationality	Father	Mother
American	5	5
Bohemian	0	1
English	0	1
French	1	0
German	1	7
Irish	8	3
Italian	2	2
Jewish	2	2
Polish	3	1
Russian	1	1
Scotch	0	1
Serbian	1	1
Swedish	1	0
Yugoslavian	1	1
Total	26	26

## APPENDIX V

AGES OF PARENTS OF 26 CHILDREN ENROLLED IN THE  
SOUTH SIDE SPECIAL PLAY SCHOOL

Age Distribution	Father	Mother
25 to 29 years	0	1
30 to 34 years	0	2
35 to 39 years	5	6
40 to 44 years	6	5
45 to 49 years	4	9
50 to 54 years	8	2
55 to 59 years	3	1
Total	26	26

## APPENDIX VI

OCCUPATIONAL LEVELS OF THE FATHERS OF 26 CHILDREN  
ENROLLED IN THE SOUTH SIDE SPECIAL PLAY SCHOOL

Occupational Level	Total	Per Cent
Professional Worker	4	15
"White Collar" Worker	4	15
Skilled Laborer	3	12
Semi-Skilled Laborer	8	31
Unskilled Laborer	7	27

## APPENDIX VII

AGE AND SEX DISTRIBUTION OF 26 CHILDREN ENROLLED  
IN THE SOUTH SIDE SPECIAL PLAY SCHOOL

Chronological Age	Total	Boys	Per Cent	Girls	Per Cent
5 to 5-11 years	3	2	7.6	1	3.8
6 to 6-11 years	1	1	3.8	0	0.0
7 to 7-11 years	2	2	7.6	0	0.0
8 to 8-11 years	6	2	7.6	4	15.0
9 to 9-11 years	2	1	3.8	1	3.8
10 to 10-11 years	4	2	7.6	2	7.6
11 to 11-11 years	1	1	3.8	0	0.0
12 to 12-11 years	2	1	3.8	1	3.8
13 to 13-11 years	3	1	3.8	2	7.6
14 to 14-11 years	0	0	0	0	0.0
15 to 15-11 years	1	0	0	1	3.8
16 to 16-11 years	0	0	0	0	0.0
17 to 17-11 years	1	0	0	1	3.8
<b>Total</b>	<b>26</b>	<b>13</b>	<b>50</b>	<b>13</b>	<b>50</b>

## APPENDIX VIII

NUMBER OF SESSIONS ATTENDED BY 26 CHILDREN ENROLLED  
IN THE SOUTH SIDE SPECIAL PLAY SCHOOL

Days of School Attendance	Total
124 - 123 days	8
122 - 121 days	2
120 - 119 days	6
118 - 117 days	2
116 - 115 days	1
114 - 113 days	5
112 - 111 days	0
110 - 109 days	0
108 - 107 days	0
106 - 105 days	0
104 - 103 days	2

## APPENDIX IX

NUMBER OF DAYS BETWEEN TEST AND RETEST OF 26 CHILDREN  
ENROLLED IN THE SOUTH SIDE SPECIAL PLAY SCHOOL

Days Between Test and Retest	Number	Per Cent
171 to 175 days	1	3.8
176 to 180 days	0	0.0
181 to 185 days	5	20.0
186 to 190 days	8	31.0
191 to 195 days	4	15.0
196 to 200 days	4	15.0
201 to 205 days	1	3.8
206 to 210 days	0	0.0
211 to 215 days	2	7.6
216 to 221 days	1	3.8



APPROVAL SHEET

The dissertation submitted by Marguerite Jean O'Brien has been read and approved by five members of the Department of Psychology.

The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the dissertation is now given final approval with reference to content, form, and mechanical accuracy.

The dissertation is therefore accepted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy.

November 6, 1953  
Date

Frank Kobler  
Signature of Adviser