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ETIOLOGICAL FACTORS IN MENTAL RETARDATION
OF CHILDREN FROM TWO CULTURES:
IMPLICATIONS FOR ASSESSMENT

by

SARAH VERONICA FOLEY

A Dissertation Submitted to the Faculty of the
DIVISION OF EDUCATIONAL FOUNDATIONS AND ADMINISTRATION
In Partial Fulfillment of the Requirements
For the Degree Of
DOCTOR OF PHILOSOPHY
WITH A MAJOR IN EDUCATIONAL PSYCHOLOGY
In the Graduate College
THE UNIVERSITY OF ARIZONA

1986
As members of the Final Examination Committee, we certify that we have read
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Children From Two Cultures: Implications for Assessment

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ABSTRACT

The purpose of this study was to determine the prevalence of known etiological factors in mildly mentally handicapped students across minority and nonminority groups and to examine the similarities of these patterns. A comparison of early diagnoses was also made.

The total population of all children labeled Educable Mentally Handicapped (EMH) and attending regular elementary schools within one of the largest districts in the southwest served as the sample for the present study. There were 128 children, 64 minorities and 64 nonminorities. The student records were reviewed for data regarding etiological factors, previous diagnoses and early medical factors. A pilot study which involved administering a questionnaire to a sample of twenty-eight social workers was conducted to ascertain the validity of obtained data.

Eight specific hypotheses were addressed. A Chi-Square analysis yielded information about the patterns of category similarities (congenital, prenatal, perinatal, postnatal and familial), between two groups as well as the presence of professional diagnosis. A set of five factorial analysis of variance were performed to examine the impact of age, number of symptoms, presence of professional diagnosis and length of hospital stay on IQ scores of children in both
groups. A discriminant function analysis was performed to determine the discriminatory power of four variables (IQ, length of hospital stay, number of symptoms and presence of professional diagnosis).

The prevalence of perinatal and postnatal symptoms and diagnoses occurred with high frequency for both groups. Congenital factors occurred significantly more for the nonminority group. The findings indicated that there were no significant differences across minority and nonminority groups in terms of intellectual functioning due to the impact of the four previously mentioned variables. Consistent with the ANOVA results, the information obtained from the discriminant function analysis suggests similarity of the two groups in terms of the four variables.

The results were discussed in relation to the utility of early etiological information and the importance of such research. The implications of such findings for placement of children in general in these classes or for the children from minority groups in particular, were emphasized.
CHAPTER 1
INTRODUCTION

Legislation and litigation have been major influences shaping psychoeducational assessment and services for handicapped and ethnic minority group children. Traditional assessment tools and procedures have been considered inappropriate for use with children whose ethnic, racial, and social class origins lie outside of the middle class, Anglo-American mainstream. The observation that minorities were overrepresented in classes for the mentally retarded encouraged this dissatisfaction with traditional assessment practices. Both plaintiffs in Diana v. State of California, 1970 and Guadalupe v. Tempe Elementary District, 1972 presented evidence indicating overrepresentation of minority students in EMR programs.

Guadalupe was a suit filed on behalf of Mexican American and Yaqui Indian school children enrolled in classes for the mildly mentally retarded. One of the requirements made through a consent decree was that the results of IQ tests shall not be the primary or exclusive basis for mental retardation classification in the schools.

Public Law 94-142, The Education for All Handicapped Children Act of 1975 (Federal Register, 1977), has direct
implications for the improvement of all assessment procedures. This law insists on certain assessment standards such as not basing classification and placement decisions on a single source of data. Multiple data sources (e.g., teacher recommendations, adaptive behavior) must be used. Mercer and Ysseldyke (1977), find that these multiple data sources such as medical data, objective behavioral observations, adaptive behavior, and home environment variables, are relevant to a comprehensive evaluation and need to be utilized more. Information from many sources need to be used in the evaluation of an individual presenting various difficulties with an emphasis on individualized assessment, placement decisions and educational programming.

Reschly (1980) contributes a positive viewpoint to the frustrating discrepancy between the demands placed on the profession of school psychology and the ability to implement those requirements. The demands stemming from special education legislation and litigation should provide "legal authority" to progress towards developing and implementing higher quality assessment and more effective interventions for all children.

Henderson and Valencia (1985) think that nondiscriminatory psychological services are possible if school psychologists function as problem solvers.
Successful problem solvers are open to multiple sources of evidence and use this information as hypotheses to be tested. They also view assessment as providing data to be interpreted from various perspectives in an individualized fashion. There are various ways to conceptualize and examine problems. Caplan (1964) views problems in the context of prevention. He attempted to clarify the semantics of prevention. He describes three preventive efforts. Primary prevention refers to the steps taken to avoid an occurrence, whereas secondary prevention is the early treatment of the disease while seeking to shorten the duration or negative effects. Tertiary prevention is the attempt to minimize long-term effects and focuses on difficulties already being experienced.

Zigler, Kagan and Muenchow (1982) find the need for all three preventive efforts within schools. P.L. 94-142 emphasizes the responsibility of schools to provide services for all children whether mildly or severely handicapped. Bower (1965) suggests that primary prevention programs are "aimed at persons not yet separated from the general population" (p. 837).

Since research supports the contention that Educable Mentally Handicapped (EMH) children are not identified as such until and because of school, it would appear that secondary and tertiary prevention would naturally occur within school systems since these children would already be
separated from the general population (Carter, 1978; Grossman, 1983).

Primary intervention is supported by early intervention research success (Kirk, 1948, 1973; Lazar, Hubbel, Murray, Rosche & Royce, 1977; Skeels, 1939, 1966). Ingalls (1978) feels that the best way to deal with the problem of functional retardation is to prevent it rather than to provide a massive dose of special education once it has been diagnosed. Certain early information that could relate to later school problems needs to be gathered and analyzed in order to support the enthusiasm for primary intervention and initiate awareness of potential difficulties. Such information has been gathered in various descriptions of high-risk factors for later problems.

The identification of mildly retarded behaviors is a responsibility shared with many persons who are concerned with the development of the child, including the parents. Some children with mild mental retardation may have abnormal medical findings but are seen inconsistently in medical facilities. Children may be identified in day care, nursery or preschool programs where certain behaviors and abilities are required. Others are not identified until the early school years on the basis of inadequate academic performance, low measured intelligence, low achievement test scores, and behaviors which are considered to be adaptively deficient within the school setting. Mild mental
retardation may be suspected by parents although they may overlook the signs or fail to verbalize their concern for long periods of time (Carter, 1978).

Despite these legal and other supportive attempts at encouraging early assessment and intervention, there are still problems with early diagnosis, identification and placement procedures for practitioners. There is a lack of uniformity in regards to strategies and techniques for early identification and knowledge regarding etiological factors for mildly mentally handicapped individuals.

The purpose of this study therefore, was to determine the prevalence of known etiological factors in mildly mentally handicapped students across minority and nonminority groups. To what extent these etiological factors were identified in these children prior to entering public school was also examined. Additionally, the study was aimed at examining the similarities of prevalent patterns for children labeled educable mentally handicapped. The pattern of these early factors were examined across two groups of students already placed in classrooms for Educable Mentally Handicapped. Cumulative records of these children were reviewed to obtain information relating to early factors and their relationship to later disability. It was anticipated that such information would emerge from the perusal of etiological factors, early medical information, records of previous diagnoses and current special education
category the students are assigned to. The available information thus obtained helped determine when these children have become suspect initially and which factors were present retrospectively, that may serve as possible cues for later academic difficulties. All the variables under examination in the present study were grouped into five categories which are: Congenital, Prenatal, Perinatal, Postnatal and Familial. In addition to early etiological factors, an analysis of current intellectual functioning of students in both groups, was also performed.

Although known etiological factors related to mental retardation are reported as present in only 10-20% of all cases of mental retardation, it was hypothesized that these factors are present in a significantly higher percentage in the records of school-age children placed in educably mentally handicapped programs. It was also assumed that such information would be available across minority and nonminority groups. There is evidence that many of these children are identified and labeled as developmentally delayed or retarded before they are identified by the schools.

The implications of such research investigating the relationship between mentally handicapped students, known etiological factors and previous diagnosis will assist special education personnel in improving and refining the procedures for the identification, evaluation and placement
of these students. The study will also be productive in the
development of more appropriate educational programming for
the mentally handicapped.

The data obtained will be beneficial in predicting
service needs, facilitating child-find efforts and promoting
better understanding of the complexities of labeling the
mentally handicapped. The study will provide valuable
information which will assist families, local agencies,
professionals and school district personnel to work more
effectively together in identifying and intervening with,
the mentally handicapped with the awareness of the
prevalence of various factors associated with such a
handicap.
CHAPTER 2
REVIEW OF LITERATURE

This chapter is aimed at summarizing the relevant literature concerning the early identification of factors prevalent in mild retardation and the pattern of these factors across minority and nonminority groups. The review will revolve around the following areas: The Need for Early Assessment, Early Assessment and Intervention and Studies Related to the Examination of Etiological Factors.

Need for Early Identification

It is necessary to make a determination of which children are at high risk for problems at some time in the future and to provide them with the necessary stimulation, training, and medical attention that they require in order to effectively prevent the problem of functional retardation. According to Grossman (1983), AAMD suggests that early clinical assessment should be encouraged in order to minimize the child's experience of failure in school. Carter (1978) describes possible reasons why a child would be diagnosed - inadequate academic performance, low measured intelligence, low achievement test scores, and behaviors which are considered to be adaptively deficient with the
school setting. All of these reasons deal with failure during the school experience.

Many researchers support the idea that the effects of a handicap can be reduced and potential handicaps often prevented, when high-risk and handicapped infants are identified early and given appropriate intervention (Beller, 1979; Horowitz and Paden, 1973). According to Denhoff (1979), the beneficial effects of the intervention on development can be seen not only in the short term but also years later. Steps in this direction include such programs as the Early and Periodic Screening, Diagnosis and Treatment Program (EPSDT). This program is designed to prevent people on Medicaid from developing handicapping conditions. Some people define the "at risk" population in terms of medical criteria. Parmelee, Sigman, Kopp and Haber (1976), developed a screening battery to obtain scores on five factors termed as: Obstetric complications, postnatal factors, newborn neurological exam, visual attention test and a sleep polygraph. Various tests are given immediately after birth in the neonatal period, at three to four months and at eight or nine months. Parmelee requires more than a single score in making the determination that an infant is at risk. The medical model viewpoint provides additional assessment data and encourages early identification of children at risk.
Ingalls (1978) believes that the current emphasis of providing special services for children diagnosed as handicapped or suspect, during the preschool years stems from the precautionary philosophy that this emphasis is an attempt to minimize the effects of the handicap and to prevent the secondary disabilities such as emotional, behavior and academic problems which may accompany such disabilities. The need for developing educational intervention programs for the preschool child has been emphasized due to this growing awareness of the importance of early childhood experiences (Haskins, Finkelstein & Stedman, 1978; Hodges, Lapides & Phillips, 1977).

Although the literature is still in the process of examining the premise of early intervention benefits, the legal arena pushes for such research as well as programming. The Bureau of Education for the Handicapped within the department of Health, Education, and Welfare included early childhood education as one of its target areas for the 1970s. This emphasis has helped make early education a prominent national issue (Martin, 1971).

Programming for handicapped preschool children emphasizing the need for early identification and treatment examination is also supported by P.L. 94-142 which offers an incentive grant to support such programming. The need for research in this area is apparent and in progress. Such programs as the Utah Center which revolves around providing
research results which will elucidate the possible benefits of early intervention. It becomes more than a premise that one agrees or disagrees with when mandates are set forth to encourage scientific examination of the issue.

The emphasis is on the growing suspicion during early life rather than waiting until full manifestations are apparent (Illingworth 1966). The aim of family physicians, pediatricians, public health services and families today should be to detect babies at risk of suffering from handicaps before pronounced difficulties are present (Sheridan 1962; Walker 1967). The hope is that by suspecting abnormalities and looking for them, diagnosis may be made earlier and the worst effects of the conditions found can be avoided by intervening early. Nonorganically caused deficits are not apparent at birth but seem to develop in the first two years of life (Knobloch and Pasamanick 1953; Ramey and Haskins, in press). This lack of a physical syndrome at birth may cause problems in early identification of children who need special preventive services and reliance on the identification of possible factors to be used as a cue for future problems may be necessary.

Mercer and Ysseldyke (1977) discuss the interpretation of test scores from a medical model viewpoint as one aspect of a thorough assessment. Since the information is based on biological factors, the individual
interpreting the meaning of such information based on the medical model, does not need to have sociocultural information about the person to interpret the meaning of such information or score. The model should therefore not yield results which are racially or culturally discriminatory if examination of biological factors is the emphasis.

Early Assessment and Intervention

Programming for preschool aged children requires adequate assessment procedures with these children. Gerken (1979) emphasizes the need for practical knowledge and experiences with preschoolers before beginning assessment. Data needs to be gathered within the home and other environments. Research has emphasized a variety of techniques for identifying possible factors to use as cues for future problems.
Sheridan (1962) examined five main categories that experts utilized in determining that children were at-risk of showing physical or mental handicaps.

1. Where there is a known family history of genetically determined disease such as spina bifida.

2. When abnormalities during pregnancy occur which affects prenatal life of the infant such as toxemia.

3. When abnormalities occur during the perinatal period such as breech extraction.

4. When a history of abnormal behavior in the postnatal period which is associated with or could cause mental handicap such as seizures or occurrence of jaundice.

5. When the development is viewed as aberrant or erratic by family or physician.

Preschool age children who are considered intellectually high-risk can benefit from educational intervention as supported by such researchers as Garber and Heber, (1977); Lazar et al. (1977a); and Ramey and Campbell, (1979). Agreement is arising from preschool intervention projects that response to treatment is probably improved by early identification and intervention (Bronfenbrenner, 1975; Lazar, Hubbell, Murray, Rosche & Royce 1977b). Ramey and Brownlee (1981) believe that it may be in the interests of economy and efficiency to specify more precisely which children are at high-risk for mild mental retardation and to do so as early in the child's life as possible.
Assessment activities need to be combined with appropriate interventions in order to provide programs and services that benefit individuals. When this is conceptualized as one process, more efficient use of assessment time is utilized as well as providing more direct and relevant information concerning intervention. The most accurate diagnoses and proficient assessments are useless without adequate, effective intervention plans. Otherwise the benefit to the individual is questionable. The use of reliable and valid procedures, multiple data sources for assessment, services in the least restrictive environment and effective interventions developed from useful assessment, would result in a better coordination between assessment and intervention (Reschly, 1980).

In summary, current trends emphasize early intervention programs for children considered "at-risk" for later academic problems, such as mild mental retardation. There are legal mandates emphasizing the importance of identifying children in need of early intervention. Research supporting this emphasis is needed and in progress. Research is already supporting such efforts such as the Goodman, Cecil and Barker (1984) study which is discussed in the next section. Current intervention trends utilize assessment information in order to determine the appropriateness of a given program for a particular person (Kass, Sigman, Bromwich & Parmelee, 1976).
This information appears to conflict with Mercer's (1973) contentions of mild retardation occurring only because of the school's assessment techniques and the biased nature of such techniques. If such is the case, one would not see the need or success for such early screening and intervention.

Literature on the effects of early intervention differentiate programs for low-income "at-risk" children from those serving the mentally retarded with biological impairments (Browder, 1981; Piper & Pless, 1980; Ramey & Smith, 1977). This differentiation is based on the assumption that early intervention for potentially normal children of the poor may not be effective for the organically mentally retarded. Goodman et al. (1984) found that few studies had analyzed the effectiveness of intervention programs in general, or how child characteristics differentially predicted outcomes. They attempted to describe how child descriptors such as etiology, social status and IQ relate to improvement when involved with a special program which emphasized parent participation as compared with children not involved in such a program. Their results did not support the assumption mentioned above that there are differential outcomes for delayed children with and without biological impairments. In fact their findings demonstrated that over an average of 16 months, the group in the special program showed a mean
gain of 8.1 IQ points and children from backgrounds of poverty with non-organic problems did not show greater IQ increments than those with biological etiologies and in better economic circumstances. There was no relationship between medical diagnosis and amount of IQ change.

**Importance of Etiological Factors**

Various research studies have stressed and contributed to this medical/biological viewpoint (Costeff, Cohen & Weller, 1983a; Costeff, Cohen & Weller, 1983b; Clarke & Clarke, 1977; Czeizel, Lanyi, Klijber, Metneki & Tusnady, 1980; Drake, 1968; Herbst & Baird, 1983; Hill, Bruininks & Lakin, 1983; Hunter, Evans, Thompson & Ramsay, 1980; Moser & Wolf, 1971; Smith & Bostian, 1964; Smith & Simons, 1975; Taylor & Fletcher, 1983; Thoene, Higgins, Krieger, Schmickel & Weiss, 1981; Zigler, Balla & Hodapp, 1984), emphasizing the importance of early high risk factors/situations and providing medical and neurological information relating to later problems. These factors range from clear-cut difficulties such as PKU to more complex interactive difficulties such as low SES or birth complications.

Research studies have examined mental retardation in terms of the prevalence of factors, (potentially causative), associated with mental retardation. According to Penrose (1963), medical investigations of people with mild
retardation demonstrating clear-cut present or past neurological illness occur in only a small proportion. He asserts that a larger proportion of the more severely retarded have clear-cut etiological diagnoses.

In 1980, Hunter, Evans, Thompson and Ramsay carried out a study of patients under 20 years of age with moderate, severe or profound mental retardation. The major objective of his study was to assess the various causes of retardation in this population. These patients were assigned to one of three categories: genetic, acquired or unknown causes. Patients were assigned to the genetic group either on the basis of a recognized chromosomal imbalance, a known or probably genetic metabolic disease or syndrome, or because they had a sibling or parent with a similar pattern of nonacquired retardation. Patients were assigned to the acquired group when the history and physical examination indicated that an event had occurred during the prenatal, perinatal or postnatal period that had damaged the child. They found that 27.8% of the cases had genetic, 30.3% had acquired and the remainder had unknown causes.

This emphasis on the examination and expectation of factors present in moderate, severe and profound levels of retardation appears to have been the trend in research. Due to these observations, researchers have used the terms "cultural-familial retardation", "subcultural defect", "six-hour retarded child" and "social-familial retardation"
when describing and discussing mild retardation. Such terms imply that mild retardation is within the statistical expectation for the population in general (Costeff, Cohen & Weller, 1983a). It also implies that mild retardation is caused either by heredity or by social factors such as cultural deprivation. This is in contrast with the term "pathologic retardation" applied to retardation of moderate and severe degrees which is assumed to have a recognizable etiology.

This observation was supported by Moser in 1971 when he studied mental retardation by dividing them into two groups. "The first group consisted of the mildly retarded (IQ 50-70), whose deficit, for the most part is a reflection of the expected variability of human intelligence and of adverse sociocultural factors" (Moser & Wolf, 1971). The second group included the moderately, severely and profoundly retarded (IQ <50), most of whom had brain damage. His clinical survey indicated that the most common cause was acquired brain disease which was present in 26% of his group, the next highest cause was chromosome disorders which occurred in 18.7% of his group. Moser does assert that there is a need for systematic and quantitative study of the nervous system of mildly retarded individuals and that the role of the biological factors has not yet been assessed but his study does not address these issues either.
Costeff et al. (1983a), presented evidence that the main cause of mild retardation may be brain damage as a result of biological disturbances during pregnancy, delivery or infancy rather than heredity or social deprivation. This evidence was derived from a survey of the medical histories of 236 children with idiopathic (mild) retardation. The factors studied were pregnancy, delivery and the infancy period. Some of the factors included were: pregnancy - bleeding, toxemia, illness, trauma, or prematurity; delivery - breech, fetal distress, prolonged labour, neonatal anoxia or neonatal jaundice or apnea; infancy - head trauma, seizures, meningitis or encephalitis. Medical histories were examined to determine whether they showed one or more of the significant biological disturbances mentioned above. All groups were analyzed for the presence or absence of significant prenatal, perinatal or infantile biological disturbances. The results show that these disturbances were equally prevalent among cases of mild and severe retardation. Known prenatal, perinatal and infantile biological disturbances occurred in 71% of those with an IQ between 50 and 69 and in 62% of those with an IQ under 50. No significant influence of ethnic origin on prevalence of biological disturbances was seen in any category of mild retardation.

Costeff states that their major finding is that as high a prevalence of pathological prenatal, perinatal and
infantile biological disturbances occurred among those with mild retardation as among those with severe retardation. The most significant single disturbance among those with mild retardation was a history of maternal reproductive inefficiency. He further asserts that this high prevalence is not a product of socioeconomic class since it was not related to either family size or ethnic origin. The abnormal medical histories found among the mildly retarded suggest that mild retardation is no less pathological than is severe retardation. Similar studies and results were found by Hagberg, Hagberg & Lewerth (1981); Drillien (1968); and Lilienfeld & Pasamanick (1956). These studies were based entirely on hospital birth-records and their findings suggest that a high prevalence of developmental biological disturbances may be found in populations with mild retardation. These findings conflict with the view that mild retardation is predominantly "cultural-familial" and is not pathological in nature.

Costeff, Cohen and Wella (1983b), examined etiologies in mildly retarded individuals and found that among mild mentally retarded individuals, 71% had nongenetic brain damage. Costeff views this as being at disagreement with the usual interpretation of mild retardation as predominately caused by cumulative cultural and genetic factors and having a low prevalence of developmental disturbances.
In summary the trend of research has been to examine the prevalence of various factors associated with retardation. However, the emphasis has been on the moderate, severe and profound levels of retardation. Current research has begun to examine these same factors with mild levels of retardation. Some of these same factors appear to be prevalent in mild forms of retardation as well. There is a sparcity of research dealing with this issue especially across minority and nonminority groups.

The present study addressed these issues by examining the records of minority and nonminority children placed in mentally retarded classrooms and collecting data regarding etiological factors, early medical information, previous diagnosis, current special education label and ethnic code. The information available has determined when these children may have become suspect initially and which factors were present retrospectively, that may serve as cues for later academic difficulties. It was assumed that this population will present more of these suspect factors than researchers, such as Mercer, believe. The prevalence and pattern of these factors was examined across minority and nonminority groups.
CHAPTER 3
METHODS

This chapter is devoted to the description of methodology used to examine the hypothesized relationships. For convenience the chapter will be divided into the following sections: Subjects, Data Collection Procedures, Instruments, Description of Variables, Hypotheses and Data Analysis.

Subjects

The subjects for this study were 128 elementary school-age children from one of the largest school districts in the Southwest. This sample was the total population of all children labeled Educable Mentally Handicapped (EMH) and attending regular elementary schools within this district. The children were born between May 1973 and April 1981, ranging in age from 5 years, 2 months and 10 years, 1 month. There were 54 females and 74 males.

Among the 128 subjects, 64 were nonminorities and 64 were minorities. Within the minority group there were 40 Hispanics, 18 Blacks and 6 American Indians.

Table 1 exhibits a breakdown of the sample groups used for this study.
Table 1

Sample Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Females</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caucasians</td>
<td>64</td>
<td>23</td>
<td>41</td>
</tr>
<tr>
<td>Hispanics</td>
<td>40</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>Blacks</td>
<td>18</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>American Indians</td>
<td>6</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

The criteria used for these placements were established by the specific school district which emerged from both state and federal guidelines. Consistent with these guidelines, "EMH is a term used to describe the degree of retardation present when intelligence test scores are 50 to 55 to approximately 70; many mildly retarded (educable) individuals who function at this level can usually master basic academic skills whereas adults at this level may maintain themselves independently or semi-independently in the community. They appear to be neurologically intact and have no readily detectable physical signs or clinical laboratory evidence related to retardation" (Grossman, 1983). The criteria used for EMH placement within the context of this study was more specifically determined in the following manner: "In order to place a student in an EMH program, the student must be considered to be mildly retarded and because of subnormal mental development be unable to profit sufficiently from the regular school
program alone. An educable mentally handicapped student usually achieves or functions at an IQ level of approximately one-half to three-fourths of average intelligence based on individual psychological assessment. Academic expectancies for the student will vary depending on the degree of the handicap." The IQ scores for the sampled children were found to be on the average 61.19, SD=8 for minorities and 61.20, SD=7 for nonminorities. A placement in EMH programs is never made primarily on the basis of a single test. A comprehensive evaluation includes the following test components appropriate for the individual child: intellectual, academic and adaptive measures, medical history, developmental history, physical-vision/hearing testing, behavioral observations, teacher's anecdotal records and speech and language evaluation. (see Appendix A for detailed descriptions).

Data Collection Procedures

The student records were identified through District class lists. Each student record was randomly assigned a three-digit number and the list of these numbers for each student record remained in the Service Center to insure confidentiality of records. The records were reviewed for data regarding etiological factors, previous diagnosis, early medical factors, current special education label, sex, age and ethnic code. Each file was examined by two
independent raters who have been trained in the specific data collection involved.

**Instruments**

Record keeping forms developed for review of data in student records regarding etiological factors, previous diagnosis, early medical information, current special education label, sex, age and ethnic code were used.

**Description of Variables**

Aberrant indicators can be discovered before conception, during pregnancy, during labor and delivery, at birth or may be delayed until abnormalities of behavior are observed in infancy or in later childhood. Yannet (1945, 1956) suggested a system of classification which separated various factors of mental retardation into four categories: prenatal, perinatal, postnatal and genetic. The present data was examined by categorizing aberrant factors into six categories. These categories are: Genetic/Congenital, Prenatal, Perinatal, Postnatal and Familial/Environmental. (see Appendices B and C for complete listing of factors under each category). Diagnostic information was also gathered in order to determine the degree to which this sample was professionally diagnosed prior to school.
Congenital Category

Congenital factors intended to be included in this category were physiological deviations such as congenital heart defects, hydrocephalus, PKU and known mental retardation syndromes such as Down's, Turner's and Barr's. These factors were present at birth and are strongly associated with mental retardation although the actual causes are not always known, some have an apparent genetic basis.

Prenatal Category

Factors within the prenatal category included such disorders as maternal exposure to rubella and ill-health in the mother especially diabetes and chronic infections. There are disorders of pregnancy that may raise an index of suspicion for a pediatrician that the child may have difficulties. Disorders that are likely to cause interference with placental functioning such as toxemia and ante-partum hemorrhage increase this index of suspicion.

Perinatal Category

Abnormalities of the perinatal category included aberrant forms of labor and delivery including extremely difficult and long labors, prematurity and breech births requiring a cesarian section. The behavior of the infant at birth is a critical component of this category. Aberrant
behaviors at this time included seizure activity and neonatal apnea/hypoxia. Basically this category included any factors related to the newborn requiring special attention such as the occurrence of jaundice.

Postnatal Category

The postnatal category consists of traumas and abuses that the young child may undergo. The development of multiple illnesses and seizures are suspect and included in this category as are apparent developmental delays as reported by the reporting family member, usually the mother.

Familial Category

Included in this category are all children who have a family member, either in the nucleus or extended family, that has either been diagnosed as mentally retarded, developmentally delayed or exhibited difficulty in school possibly requiring special education if such was available.

Diagnostic Information

Diagnostic information was gathered for all children who had professional diagnoses prior to entry in school. Developmental delays and mental retardation are the primary diagnoses included.

In summary, various factors that appear to be prevalent in cases of retardation, (mild, moderate, severe and profound), have been included within the five categories
which have been temporally sequenced. The various factors have been revised based on the prevalence of factors that research has supported and the prevalent findings among the subjects of the present study.

Table 2 provides concise examples of prevalent, aberrant factors found within each category under discussion and also found within Appendices B and C.

Table 2
Examples of Aberrant Factors in Each Category

<table>
<thead>
<tr>
<th>Category</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>History -</td>
<td>Congenital Heart Defect</td>
</tr>
<tr>
<td></td>
<td>Hydrocephalus</td>
</tr>
<tr>
<td>Prenatal -</td>
<td>Toxemia</td>
</tr>
<tr>
<td></td>
<td>Infections</td>
</tr>
<tr>
<td>Perinatal -</td>
<td>Prematurity</td>
</tr>
<tr>
<td></td>
<td>Hypoxia</td>
</tr>
<tr>
<td>Postnatal -</td>
<td>Trauma</td>
</tr>
<tr>
<td></td>
<td>Seizures</td>
</tr>
<tr>
<td>Familial -</td>
<td>Family Retardation</td>
</tr>
<tr>
<td></td>
<td>Family Delays</td>
</tr>
</tbody>
</table>

Hypotheses

The following hypotheses stated in the null form were the primary foci of this study.
Hypothesis 1

The prevalence of the most frequently occurring symptoms within the five categories and the presence of a professional diagnosis will be similar across minority and nonminority groups.

Hypothesis 2

There will be no difference in the frequency of occurrence between the five categories and with the presence of a professional diagnosis across minority and nonminority groups. The categories are broken down into the following times when factors were observed: Congenital, Prenatal, Perinatal, Postnatal and Familial. Frequency of professional diagnoses across both groups was also examined.

Hypothesis 3

There will be no difference in frequency between parents who report developmental delays, professionals who report developmental delays, when both parents and professionals report developmental delays and when no developmental delay is reported.

Hypothesis 4

There will be no IQ differences between three age groups across minority and nonminority groups. The age groups are determined by the years of birth. Those children born between 1973 and 1975; between 1976 and 1978 and
between 1979 and 1981 inclusively, make up the three age groups.

Hypothesis 5

There will be no IQ differences between groups with varied amounts of symptoms across minority and nonminority groups. The groups will be broken down according to the overall frequency of aberrant symptoms. Three groups will be formed: those with no symptoms, those with one to five symptoms and those with five or more symptoms.

Hypothesis 6

There will be no IQ differences between the group with professional diagnoses and the group without professional diagnoses across minority and nonminority groups.

Hypothesis 7

There will be no IQ differences between the group with an average hospital stay and the group with a lengthy hospital stay across minority and nonminority groups.

Hypothesis 8

The factors: IQ, length of stay in hospital at birth, number of overall symptoms and presence of professional diagnosis will not distinguish between minority and nonminority group membership.
Data Analysis

Consistent with the above stated hypotheses three sets of analyses were used. These analyses are Chi-Square, Analysis of Variance and Discriminant Function Analysis.

In addition to obtaining the necessary data for testing the listed hypotheses, a pilot study was conducted to ascertain the validity of obtained data. This involved administering a questionnaire to the available sample of social workers. The questionnaire was designed to seek information in regards to how consistently social workers routinely and systematically collect developmental and other information related to placement of children into EMH classes. Also opinions of social workers were obtained regarding the validity of parental information obtained by them for the purposes of placement decision making (Appendix D).

The degree of similarity across minority and nonminority groups in relation to the prevalence of symptoms ranked within each of the five described categories and with the presence of a professional diagnosis prior to school was examined as put forth in H1.

The analysis and interpretation of frequency data is accomplished through the Chi-Square statistic. It attempts to determine if two or more groups differ in respect to the frequency of various characteristics. This is accomplished by examining the number of frequencies that fall into each
category for one group and determining whether they differ significantly from the number that fall into each category for another group or groups. Even though the Chi-square test is analyzed in terms of frequencies, Minium (1978) views the Chi-Square test conceptually as a test about proportions.

The present study utilized the Chi-square statistic to test two hypotheses, H2 and H3, which are related to the examination of the differences in the presence of diagnoses and the presence of various factors across minority and nonminority groups. The frequency between parents who report developmental delays, professionals who report developmental delays, when both parents and professionals report developmental delays and when no developmental delay is reported was examined. In addition the frequency of occurrence between five categories of symptoms across minority and nonminority groups was examined. The five categories are broken down into the following times when factors were observed: Congenital, Prenatal, Perinatal, Postnatal and Familial. A comparison was also made in regards to the presence of a professional diagnosis prior to school across minority and nonminority groups.

The Analysis of Variance is usually used to test statistical hypotheses about the significance of the differences between means of more than two groups. The estimation of component variances can also be determined by
the use of this statistic.

Within the context of this study Analysis of Variance was used to test four hypotheses, H4 through H7, which are related to the examination of IQ differences across minority and nonminority groups, due to the influence of age, amount of symptoms, length of hospital stay and presence of prior diagnosis. For all four hypotheses the independent variable was minority and nonminority group membership. For all four hypotheses the interval level, dependent variable was the IQ score. The comparison across these groups included the following independent variables:


2) Group with professional diagnoses and the group without professional diagnoses.

3) Group with varied amount of symptoms – those with no symptoms, those with one to five symptoms and those with five or more symptoms.

4) Group with an average hospital stay and a group with a lengthy hospital stay.

Discriminant Function Analysis is used when two or more groups are compared in terms of many variables. Cooley and Lohnes (1962) describe Discriminant Analysis as a procedure for estimating the position of an individual on a line that best separates classes or groups. The estimated position is obtained as a linear function of the
individual's score. Studying the direction of group differences requires finding a linear combination of the original predictor variables that shows large differences in group means. Discriminant analysis is a method for determining such linear combinations (Tatsuoka, 1971).

Discriminant Function Analysis was used to test H8 which is related to determining the discriminating power of various factors across minority and nonminority groups of children labeled educable mentally handicapped. The factors are: IQ, length of stay in hospital at birth, number of overall symptoms and presence of a professional diagnosis.
CHAPTER 4
RESULTS

This chapter is devoted to the presentation of the findings related to the specific hypotheses discussed in earlier chapters. The findings pertain to the validity of the obtained data, etiological characteristics, symptom patterns and intellectual performance characteristics of sampled subjects from two ethnic groups.

Validity of Obtained Data

Prior to obtaining the necessary information for testing the hypothesized relationships, a pilot study was conducted to determine the validity of obtained data. This involved administering a questionnaire to the available sample of social workers (Appendix D). A questionnaire specifically designed for this purpose was administered to twenty-eight social workers of which twenty-two were completed and returned. The social workers completing the questionnaire are responsible for obtaining the type of developmental history which formed the basis for the data examined in this study (Appendix E). The purpose of this aspect of the study was to examine the extent to which these practitioners would obtain the developmental history data,
which would hopefully suggest the validity of data used in the study.

The first aspect addressed was to specify the frequency with which the social workers generally seek information regarding various etiological factors under examination in this study. The obtained data indicated that in general the social workers would include 78% of all the etiological factors under examination in their developmental interview with parents. With regard to the category of congenital symptoms, it should be noted that even though 50% of the social workers expressed that they generally do not seek such information, they did express that information related to these symptoms was generally available to them because of the conspicuous nature of such symptoms or ailments.

The pilot study was also aimed at determining how consistently various aspects of developmental issues would be routinely examined by practicing social workers in their interview with parents. The responses pertaining to this issue indicated that approximately seventy-eight percent of the social workers considered themselves very consistent to highly consistent in terms of asking the same questions to all the parents. Ninety-five percent of the respondents also indicated that family and educational history factors are covered in their interview all of the time. Also, all the social workers indicated that birth, physical, health
and personal-social aspects were examined by them for all the cases being considered for placements.

Another aspect examined was the determination of the social workers regarding the accuracy of parental information. The obtained data suggested that 86% of respondents considered parental information about their children to be in the range of moderately to extremely accurate.

The obtained information from a sample of practicing social workers does therefore seem to suggest that the type of information which formed the basis of this study is consistently and routinely obtained by the social workers in their initial phases of placement decisions. Contrary to common fears about the objectivity of parental information, it is interesting to note that the majority of social workers felt that the information given by parents was accurate. It is, however, interesting to note that even though social workers were somewhat unclear about the utility of information concerning early etiological symptoms and developmental history data, there was a remarkable pattern with which such information was uniformly and consistently obtained by them. A possible reason for the uniformity of data may be that the district has developed a general guideline for conducting parental interviews. The content of such a guideline therefore might have contributed
to the consistency and uniformity of overall data collection patterns (Appendix F).

Prevalence of Early Symptoms in Sampled Subjects

Prior to discussing specific findings it should be of interest to note that two groups exhibited a remarkable similarity in early etiological factors. As an example two groups of EMH children were found to be similar in their chronological ages. The groups also were found to be similar in terms of whether they were diagnosed professionally or not. There were very few children in both groups (N=3) for whom no symptoms were identified. For a majority of cases however, the identified symptoms at an early age ranged from 1 to 15, the number of median symptoms being 5 for nonminority and 4 for minority group. In both groups, a high percentage of children seem to have a normal stay in the hospital after birth. However, a lengthy hospital stay was found to be the same for approximately an equal number of children in both groups. The pattern of such etiological symptoms are summarized in the following table.
Table 3

Prevalence of Symptoms

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Minority</th>
<th>Nonminority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birthdate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1973-1975</td>
<td>27</td>
<td>24</td>
</tr>
<tr>
<td>1976-1978</td>
<td>25</td>
<td>26</td>
</tr>
<tr>
<td>1979-1981</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Professional Diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>41</td>
</tr>
<tr>
<td>No Professional Diagnosis</td>
<td></td>
<td>23</td>
</tr>
<tr>
<td>0 Symptoms</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1-5 Symptoms</td>
<td>39</td>
<td>36</td>
</tr>
<tr>
<td>5+ Symptoms</td>
<td>21</td>
<td>25</td>
</tr>
<tr>
<td>Average Hospital Stay</td>
<td>50</td>
<td>48</td>
</tr>
<tr>
<td>Lengthy Hospital Stay</td>
<td>13</td>
<td>16</td>
</tr>
</tbody>
</table>

Description of Symptom Patterns

This study focused on the prevalence of known etiological factors in mildly mentally handicapped students. The similarities of these prevalent patterns across minority and nonminority groups was examined along with the extent to which such factors were identified in these children, prior to entering school.

For sake of convenience, all the etiological symptoms under investigation were categorized into: Congenital, Prenatal, Perinatal, Postnatal and Familial. The Diagnostic information gathered will be discussed in a
similar fashion as the five categories. The hypothesis #1 intended to examine the similarities and the differences between two groups with regard to these five symptom categories. With regard to congenital symptoms, the obtained findings indicated that such symptoms did not occur with high frequency for either group. For 86% of the minority students, no congenital symptoms were identified as compared with 63% of the nonminority students. These symptoms were identified more for nonminorities (28 occurrences) versus 10 occurrences for minorities, however, the overall occurrence of these symptoms was low. Table 4 presents specific comparisons. There were twice as many specific symptoms occurring at least once for nonminorities when compared with minorities.

Congenital Heart Defect was the most prevalent congenital symptom for both groups occurring in 16% of the nonminorities and in 6% of the minorities. Hydrocephalus was ranked second in occurrence rate for both groups. Contrary to research regarding PKU and retardation, none of the students exhibited this factor.
<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Minority</th>
<th>Nonminority</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Congenital Heart Defect</td>
<td>4</td>
<td>6%</td>
</tr>
<tr>
<td>Hydrocephalus</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Microcephalus</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Cerebral Palsy</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Guillain-Barr Syndrome</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>No Symptoms Identified</td>
<td>55</td>
<td>86%</td>
</tr>
</tbody>
</table>

- Hemihypertrophy
- Fetal Alcohol Syn
- Spina Bifada
- Epstein-Barr Syndrome
- Agent Orange
- Microcephalus
- Crouzon's Syndrome
- No Symptoms Identified

Table 4
Congenital Symptoms Across Ethnic Groups
Examination of developmental history data for the two groups of children suggested an extremely low occurrence of symptoms belonging to the prenatal category. It is noteworthy that a large number of minority children (61%) and nonminority children (70%) did not have any identifiable prenatal symptoms. Among the identified symptoms, use of medication during pregnancy by mothers ranked highest (9%) for minority group whereas the number of infections during pregnancy was found to rank first (8%) among nonminority mothers. In contrast, the least ranked symptom was found to be stress felt by minority mothers whereas poor prenatal care, automobile accident, mother abuse, obesity and food poisoning ranked the lowest among pregnancy mothers in the nonminority sample. Summary of these findings are presented in Table 5.
### Table 5

**Prenatal Symptoms Across Ethnic Groups**

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Minority</th>
<th></th>
<th></th>
<th>Nonminority</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td></td>
<td>N</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Medication</td>
<td>6</td>
<td>9%</td>
<td></td>
<td>5</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Older Mother</td>
<td>4</td>
<td>6%</td>
<td></td>
<td>4</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>Poor Prenatal Care</td>
<td>4</td>
<td>6%</td>
<td></td>
<td>3</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Young Mother</td>
<td>3</td>
<td>5%</td>
<td></td>
<td>3</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Diabetic Mother</td>
<td>3</td>
<td>5%</td>
<td></td>
<td>3</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Physical Abuse of Mother</td>
<td>2</td>
<td>3%</td>
<td></td>
<td>2</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Mother Ill</td>
<td>2</td>
<td>3%</td>
<td></td>
<td>2</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Infections</td>
<td>2</td>
<td>3%</td>
<td></td>
<td>1</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Placental Insufficiency</td>
<td>2</td>
<td>3%</td>
<td></td>
<td>1</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Poor Weight Gain</td>
<td>2</td>
<td>3%</td>
<td></td>
<td>1</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Psychological Stress</td>
<td>1</td>
<td>2%</td>
<td></td>
<td>1</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>No Symptoms Identified</td>
<td>39</td>
<td>61%</td>
<td></td>
<td>45</td>
<td>70%</td>
<td></td>
</tr>
</tbody>
</table>

Identified
Perinatal symptoms were noted in 47% of minorities and 55% of nonminorities. This category of symptoms was found to be most frequently occurring category for both groups. Abnormal delivery (31% and 28%) was the most frequent perinatal symptom. This was followed by a lengthy hospital stay which is indicative of various complications both known and unknown. Table 6 displays the perinatal symptoms and their occurrences. The two groups did not seem to differ in the frequency of symptoms identified in early years. However, minority and nonminority groups exhibited appreciable variability in the variety of symptoms. As an example, twice as many variety of symptoms were identified during early years among the nonminority group as compared with minority group counterpart.

Jaundice and prematurity were within the top five symptoms occurring for both groups. Jaundice occurred in 11% of minorities and 19% of nonminorities; prematurity occurred in 6% of minorities and 11% of nonminorities.

Even though a wide range of symptoms were identified in both groups during early years, there were still 53% of the minorities and 45% of the nonminorities where symptoms were not reported to have been identified. A detailed description of symptoms and their frequencies is displayed in the Table 6.
<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Minority</th>
<th></th>
<th></th>
<th>Nonminority</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Abnormal Abnormal</td>
<td>20</td>
<td>31%</td>
<td></td>
<td>18</td>
<td>28%</td>
</tr>
<tr>
<td>Delivery Delivery</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lengthy Lengthy</td>
<td>12</td>
<td>19%</td>
<td></td>
<td>16</td>
<td>25%</td>
</tr>
<tr>
<td>Hospital Stay Hospital</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stay</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Low</td>
<td>8</td>
<td>13%</td>
<td></td>
<td>12</td>
<td>19%</td>
</tr>
<tr>
<td>Weight Weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jaundice Jaundice</td>
<td>7</td>
<td>11%</td>
<td></td>
<td>10</td>
<td>16%</td>
</tr>
<tr>
<td>Hypoxia Hypoxia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prematurity Prematurity</td>
<td>4</td>
<td>6%</td>
<td></td>
<td>7</td>
<td>11%</td>
</tr>
<tr>
<td>Blood Problems Blood</td>
<td>3</td>
<td>5%</td>
<td></td>
<td>6</td>
<td>9%</td>
</tr>
<tr>
<td>Problems Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight Weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypoxia Hypoxia</td>
<td>2</td>
<td>3%</td>
<td></td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Blood Problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Fever Maternal</td>
<td>1</td>
<td>2%</td>
<td></td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Fever Fever</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningitis Meningitis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Symptoms No Symptoms</td>
<td>34</td>
<td>53%</td>
<td></td>
<td>29</td>
<td>45%</td>
</tr>
<tr>
<td>Identified Identified</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seizures Seizures</td>
<td>2</td>
<td>3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postmaturity Postmaturity</td>
<td>2</td>
<td>3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypoclycemia Hypoclycemia</td>
<td>1</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever Fever</td>
<td>1</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypothermia Hypothermia</td>
<td>1</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Fever Maternal</td>
<td>1</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever Fever</td>
<td>1</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory Respiratory</td>
<td>1</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problems Problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Symptoms No Symptoms</td>
<td>29</td>
<td>45%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identified Identified</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Postnatal symptoms, such as recurrent illnesses and poor weight gain, occurred in 83% of minorities and 84% of nonminorities. These symptoms were the most frequently occurring across both groups. The identification of a developmental delay, as reported by parents, was the most common postnatal symptom. It occurred in over 50% of the students for both groups. Ear infections and various recurrent illnesses occurred in over 75% of the students for both groups.

The symptoms ranked as top eight (developmental delay, ear infections, illnesses, seizures, tubes in ears, fevers, trauma and abuse) in terms of frequency of occurrence, were the same for both groups. The actual counts and frequencies, therefore rankings, were different.

Fevers and Seizures occurred with high frequency in over 25% of the students in both groups. Trauma and abuse occurred in 30% of the minorities and 20% of the nonminorities.

Symptoms in the postnatal category were found to occur in high percentages for both groups. There was only 17% of minorities and 16% of the nonminorities where these symptoms were not reported to have occurred or been identified. The following table contains these findings.
Table 7
Postnatal Symptoms Across Ethnic Groups

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Minority N</th>
<th>%</th>
<th>Symptom</th>
<th>Nonminority N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developmental Delay</td>
<td>32</td>
<td>50%</td>
<td>Developmental</td>
<td>37</td>
<td>58%</td>
</tr>
<tr>
<td>Ear Infections</td>
<td>22</td>
<td>34%</td>
<td>Ear Infections</td>
<td>26</td>
<td>41%</td>
</tr>
<tr>
<td>Illnesses</td>
<td>19</td>
<td>30%</td>
<td>Illnesses</td>
<td>24</td>
<td>37%</td>
</tr>
<tr>
<td>Abuse</td>
<td>14</td>
<td>22%</td>
<td>Seizures</td>
<td>13</td>
<td>20%</td>
</tr>
<tr>
<td>Fevers</td>
<td>9</td>
<td>14%</td>
<td>Tubes in Ears</td>
<td>8</td>
<td>12%</td>
</tr>
<tr>
<td>Seizures</td>
<td>8</td>
<td>12%</td>
<td>Fevers</td>
<td>8</td>
<td>12%</td>
</tr>
<tr>
<td>Tubes in Ears</td>
<td>7</td>
<td>11%</td>
<td>Trauma</td>
<td>7</td>
<td>11%</td>
</tr>
<tr>
<td>Trauma</td>
<td>5</td>
<td>8%</td>
<td>Abuse</td>
<td>6</td>
<td>9%</td>
</tr>
<tr>
<td>Respiratory Problems</td>
<td>4</td>
<td>6%</td>
<td>Physical</td>
<td>4</td>
<td>6%</td>
</tr>
<tr>
<td>Behavioral Problems</td>
<td>3</td>
<td>5%</td>
<td>Respiratory</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Monitored-Risk</td>
<td>3</td>
<td>5%</td>
<td>Apnea</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Physical Aberrations</td>
<td>2</td>
<td>3%</td>
<td>Behavioral</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Poor Weight Gain</td>
<td>2</td>
<td>3%</td>
<td>Low Weight Gain</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Meningitis</td>
<td>1</td>
<td>2%</td>
<td>Meningitis</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>No Symptoms Identified</td>
<td>11</td>
<td>17%</td>
<td>No Symptoms</td>
<td>10</td>
<td>16%</td>
</tr>
</tbody>
</table>

The occurrence of familial symptoms was comparatively low. The occurrence of such symptoms for minorities were
found to be among 23% of the children where 14% of nonminority children had familial symptoms. Fourteen percent of placed children in both groups had a brother or sister who were placed in special education classes. No identifiable familial symptoms were reported during early years for 77% in minority and 86% in nonminority group.

Table 8

<table>
<thead>
<tr>
<th>Familial Symptoms Across Ethnic Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minority</td>
</tr>
<tr>
<td>Symptoms</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Sibling Sp Ed</td>
</tr>
<tr>
<td>Sibling EMH</td>
</tr>
<tr>
<td>Mother MR</td>
</tr>
<tr>
<td>Mother Sp Ed</td>
</tr>
<tr>
<td>Cousins Delayed</td>
</tr>
<tr>
<td>Sibling Delayed</td>
</tr>
<tr>
<td>Paternal Delay</td>
</tr>
<tr>
<td>Parents Borderline</td>
</tr>
<tr>
<td>Father MR</td>
</tr>
<tr>
<td>MR Uncle</td>
</tr>
<tr>
<td>Cousins MR</td>
</tr>
<tr>
<td>Family Eval</td>
</tr>
<tr>
<td>No Symptoms Identified</td>
</tr>
</tbody>
</table>
Obtained data provided evidence that about 48% (N=31) of minority group children were professionally diagnosed prior to entering school as compared to 64% (N=41) of nonminority youngsters. An examination of the nature of diagnoses in both groups revealed that the most frequent diagnosis in both groups was found to be developmental delay which will be characterized by factors such as delayed speech, psychomotor retardation and overall delays in physical development. Diagnosis of mental retardation by professionals ranked second in both groups.

Table 9
Professional Diagnoses and Frequency of Occurrence

<table>
<thead>
<tr>
<th>Minority</th>
<th>Diagnosis</th>
<th>N</th>
<th>%</th>
<th>Nonminority</th>
<th>Diagnosis</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Developmental Delayed</td>
<td>26</td>
<td>41%</td>
<td></td>
<td>Developmental Delayed</td>
<td>32</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Mental Retardation</td>
<td>10</td>
<td>16%</td>
<td></td>
<td>Mental Retardation</td>
<td>17</td>
<td>27%</td>
</tr>
<tr>
<td></td>
<td>Predicted MR</td>
<td>4</td>
<td>6%</td>
<td></td>
<td>Brain Damaged</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Predicted Developmental Delay</td>
<td>1</td>
<td>2%</td>
<td></td>
<td>Multiply Handicapped</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td>Brain Damaged</td>
<td>1</td>
<td>2%</td>
<td></td>
<td>Predicted MR</td>
<td>1</td>
<td>2%</td>
</tr>
</tbody>
</table>
In summary, obtained findings indicate clearly that the two groups were highly similar in terms of various symptom categories and in the presence of professional diagnoses. It should however be noted that various specific symptoms belonging to the congenital category occurred with higher frequency for children in nonminority group in contrast to minority group.

Comparisons of Overall Symptom Categories

Another set of hypotheses that this study focused on was related to the examination of the difference in frequency across minority and nonminority groups in terms of the presence of various factors (#2) and the presence of diagnoses (#3). The frequency of occurrence between five categories of symptoms across minority and nonminority groups was examined. The five categories were broken down into the following times when factors were observed: Cogenital, Prenatal, Perinatal, Postnatal and Familial. Presence of professional diagnoses were also analyzed. In addition, the frequency between parents who report developmental delays, professionals who report developmental delays, when both parents and professionals report developmental delays and when no developmental delay is reported, were examined.
Ethnic Groups and Symptom Categories

The data concerning frequency of occurrence of the five categories of symptoms across minority and nonminority groups, was analyzed by Chi-Square statistic. The most frequently occurring category of the total group was the Postnatal category at 84% followed by Perinatal at 51%. Table 10 displays the contingency table information for each of the five categories across minority and nonminority groups.

Table 10
Category Occurrences Across Ethnicity

<table>
<thead>
<tr>
<th>Category</th>
<th>Minority %</th>
<th>Nonminority %</th>
<th>Total %</th>
<th>df</th>
<th>$X^2$ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congenital</td>
<td>14%</td>
<td>37%</td>
<td>26%</td>
<td>1</td>
<td>8.0*</td>
</tr>
<tr>
<td>Prenatal</td>
<td>39%</td>
<td>30%</td>
<td>34%</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Perinatal</td>
<td>47%</td>
<td>55%</td>
<td>51%</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Postnatal</td>
<td>83%</td>
<td>84%</td>
<td>84%</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Familial</td>
<td>23%</td>
<td>14%</td>
<td>19%</td>
<td>1</td>
<td>1.3</td>
</tr>
</tbody>
</table>

* Significant at .005 level

The only significant differences in the frequency of occurrence between the five categories of symptoms across minority and nonminority groups occurred within the Congenital category (.005). Consequently, the hypothesis
concerning a difference for this category (#2) was rejected suggesting that the two groups are different in terms of category occurrences.

The Congenital category occurred in only 14% of the minorities versus 37% of the nonminorities. Five various symptoms occurring in 17% of the minorities as compared with 13 various symptoms occurring in 50% of the nonminorities.

In addition to examining the occurrence of various symptoms within two groups of sampled subjects, an examination was also made to look at the professional diagnoses among the children of two ethnic cultures. The findings in this regard indicated that 48% of minority group children received diagnostic help as compared to 64% of nonminorities. However, a Chi-Square analysis of the obtained frequencies indicated no statistical differences ($X^2 = 2.6; df=1; p>.05$).

**Professional and Parental Diagnosis of Early Difficulties**

A 2 X 4 contingency table Chi-Square analysis was performed to compare the diagnoses of developmental delay as reported by parents, professionals, both parents as well as professionals and the pattern of diagnosed individuals within both groups. The finding of such analysis are displayed in Table 11. The data contained in this table does not suggest a significant difference ($X^2=3.5; df=3; p>.05$). Seventy-four percent of all the children were
identified as at least delayed by either the parents and/or a professional. Thirty-eight percent of the children were identified by both parents and professionals.

It should be noted that professional diagnoses consisted of a variety of terms used for the purposes of this study (i.e., mental retardation, developmental delay). In contrast to this however, parental reported symptoms only included developmental delay, suggesting various delays in behaviors such as speech, motor and other physiological patterns.

Table 11
Diagnoses Across Ethnic Groups by Parents, Professionals, Both Parents and Professionals and by Neither Group

<table>
<thead>
<tr>
<th>Report</th>
<th>Minority</th>
<th>Nonminority</th>
<th>Total</th>
<th>(X^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Parents Only</td>
<td>12</td>
<td>19%</td>
<td>10</td>
<td>16%</td>
</tr>
<tr>
<td>Professional</td>
<td>11</td>
<td>17%</td>
<td>14</td>
<td>22%</td>
</tr>
<tr>
<td>Only</td>
<td></td>
<td></td>
<td>10</td>
<td>20%</td>
</tr>
<tr>
<td>Both</td>
<td>20</td>
<td>31%</td>
<td>27</td>
<td>42%</td>
</tr>
<tr>
<td>Neither</td>
<td>21</td>
<td>33%</td>
<td>13</td>
<td>20%</td>
</tr>
</tbody>
</table>

No significant difference in frequencies were found across the two ethnic groups. Consequently the hypothesis concerning this issue (#3) is accepted suggesting that the
two groups are similar in regard to the pattern of diagnoses by parents and professionals.

Relationship of IQ to Ethnicity, Age, Symptoms, Presence of Professional Diagnoses and Length of Hospital Stay

An attempt was made to examine the intellectual functioning levels of minority and nonminority children in terms of their age, cultural background, prevalence of early etiology, presence of professional diagnoses and length of hospital stay at birth. To accomplish this five separate factorial analysis of variance were performed. The data obtained from such analyses was aimed at the substantiations of hypotheses 4 through 7.

Two ethnic groups were compared in terms of their intellectual functioning at the time of their placement as well as for the following: 1) Three age groups - determined by the years of birth. Those children born between 1973 and 1975; between 1976 and 1978 and between 1979 and 1981 inclusively, make up the three age groups. 2) Group with professional diagnoses and the group without professional diagnoses. 3) Group with varied amount of symptoms - those with no symptoms, those with one to five symptoms and those with five or more symptoms and 4) Group with an average hospital stay and a group with a lengthy hospital stay.
IQ and Ethnic Differences

Minority children were not found to be different in intellectual functioning ($\bar{X} = 61.19; SD = 8$) as compared to nonminority children ($\bar{X} = 61.20; SD = 7$). Consequently, concerning IQ differences, these results suggest that the two groups are similar in intellectual makeup at the time of placement ($F = .00; df = 1; p > .05$).

IQ and Age Comparison

The findings related to the effect of year of birth and IQ across ethnic groups are presented in Table 11. It is evident from the examination of findings contained in this table that minorities did not differ significantly as compared to their minority counterparts. Suggesting a high similarity in their IQ and age.

Table 12

ANOVA Findings Related to IQ, Year of Birth and Ethnicity

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects</td>
<td>173.3</td>
<td>3</td>
<td>57.80</td>
<td>0.92</td>
<td>ns</td>
</tr>
<tr>
<td>Year</td>
<td>173.3</td>
<td>2</td>
<td>86.63</td>
<td>1.4</td>
<td>ns</td>
</tr>
<tr>
<td>Ethnic</td>
<td>00.528</td>
<td>1</td>
<td>00.528</td>
<td>0.008</td>
<td>ns</td>
</tr>
<tr>
<td>Year X Ethnic</td>
<td>288.5</td>
<td>2</td>
<td>144.30</td>
<td>2.3</td>
<td>ns</td>
</tr>
<tr>
<td>Residual</td>
<td>7576.3</td>
<td>121</td>
<td>62.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8038.1</td>
<td>126</td>
<td>63.80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The findings as described above would lead to the acceptance of the hypothesis (#4) pertaining to the relationship between age and IQ across two ethnic groups.

IQ and Number of Symptom Comparison

The findings related to the effect of symptom amount and IQ across ethnic groups are presented in Table 12. The examination of findings contained in this table point out that minorities did not differ significantly as compared to their nonminority counterparts, suggesting a high similarity in their IQ and amount of symptoms.

Table 13
ANOVA Findings Related to IQ, Number of Symptoms and Ethnicity

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects</td>
<td>264.7</td>
<td>3</td>
<td>88.2</td>
<td>1.39</td>
<td>ns</td>
</tr>
<tr>
<td>Symptoms</td>
<td>264.7</td>
<td>2</td>
<td>132.4</td>
<td>2.09</td>
<td>ns</td>
</tr>
<tr>
<td>Ethnic</td>
<td>0.924</td>
<td>1</td>
<td>0.924</td>
<td>0.015</td>
<td>ns</td>
</tr>
<tr>
<td>Symptom X Ethnic</td>
<td>113.9</td>
<td>2</td>
<td>56.9</td>
<td>0.900</td>
<td>ns</td>
</tr>
<tr>
<td>Residual</td>
<td>7659.4</td>
<td>121</td>
<td>63.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8038.1</td>
<td>126</td>
<td>63.80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The findings as described above would lead to the acceptance of the hypothesis (#5) pertaining to the relationship between amount of symptoms and IQ across two ethnic groups.

IQ and Presence of Professional Diagnosis Comparison

The findings related to the effect of professional diagnosis and IQ across ethnic groups are presented in Table 13. It is evident from the examination of findings contained in this table that minorities did not differ significantly as compared to their Anglo counterparts. Suggesting a high similarity in their IQ and presence of professional diagnosis.

Table 14
ANOVA Findings Related to IQ, Professional Diagnosis and Ethnicity

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects</td>
<td>126.4</td>
<td>2</td>
<td>63.2</td>
<td>0.987</td>
<td>ns</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>126.4</td>
<td>1</td>
<td>126.4</td>
<td>1.97</td>
<td>ns</td>
</tr>
<tr>
<td>Ethnic</td>
<td>3.7</td>
<td>1</td>
<td>3.7</td>
<td>0.058</td>
<td>ns</td>
</tr>
<tr>
<td>Diagnosis X Ethnic</td>
<td>31.0</td>
<td>1</td>
<td>31.0</td>
<td>0.481</td>
<td>ns</td>
</tr>
<tr>
<td>Residual</td>
<td>7880.8</td>
<td>123</td>
<td>64.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8038.1</td>
<td>126</td>
<td>63.80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The findings as described above would lead to the acceptance of the hypothesis (§6) pertaining to the relationship between professional diagnosis presence and IQ across ethnic groups.

IQ and Length of Hospital Stay Comparison

The findings related to the effect of length of hospital stay and IQ across ethnic groups are presented in Table 14. It is evident from the examination of findings contained in this table that minorities did not differ significantly as compared to their Anglo counterparts. Suggesting a high similarity in their IQ and length of hospital stay.

Table 15
ANOVA Findings Related to IQ, Length of Hospital Stay and Ethnicity

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
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<tr>
<td>Main Effects</td>
<td>36.0</td>
<td>2</td>
<td>17.9</td>
<td>.276</td>
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<td>35.8</td>
<td>.552</td>
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<td>0.058</td>
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<tr>
<td>Hospital X Ethnic</td>
<td>16.1</td>
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<td>16.1</td>
<td>.248</td>
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<td>Residual</td>
<td>7986.1</td>
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<tr>
<td>Total</td>
<td>8038.0</td>
<td>126</td>
<td>63.80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The findings as described above would lead to the acceptance of the hypothesis (#7) pertaining to the relationship between length of hospital stay and IQ across ethnic groups.

Hypothesis eight examined the discriminatory power of four variables for minority and nonminority group membership. The four variables were intellectual level, length of stay in hospital at birth, number of overall symptoms and presence of professional diagnosis. The discriminatory power of these factors was examined across minority and nonminority groups by use of Discriminant Function Analysis. The discriminating power of the five predictor variables was determined by computation of Wilks' lambda. Wilks' lambda was calculated to be .9918610 for ethnic group membership; no derived discrimination equation was statistically significant ($\chi^2=1.0052$, p>.05). The data is presented in Table 16.
In summary, three major types of findings emerge. The first stems from the examination of specific patterns of symptoms in early years. The findings with regard to this aspect of inquiry indicated that symptoms pertaining to perinatal and postnatal categories occurred with higher frequency for both groups. The presence of professional diagnoses also occurred with high frequency for both groups. Secondly, the frequency comparisons showed significant differences across two ethnic groups within the congenital category, these symptoms occurring significantly more for
Finally, it was noted that ethnicity, age, number of overall symptoms, presence of professional diagnosis and length of hospital stay at birth, had no effect on obtained IQ in children with two ethnic backgrounds. Support for this last finding stems from the discriminant function analysis which also suggested that these two groups are highly similar.
CHAPTER 5
DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to examine the prevalence of early etiological factors for children labeled educable mentally handicapped and placed in special classes in regular schools. The similarities of these prevalent patterns were examined across ethnic groups. Additionally, to what extent these children were identified prior to entering school was also examined.

An overall pattern of specific symptoms and intellectual performance patterns clearly suggested a marked equivalence between two groups of children placed in EMH classes. Such a similarity in overall etiological and intellectual functioning patterns would seem to, contrary to popular public belief, suggest that two groups of placed children are highly similar. It should also be noted that out of 128 records of placed children within a period ranging from May 1973 and April 1981 showed that there were an equal number of placed students from minority and nonminority populations. However, considering the makeup of our society one would not expect the placement of minority children in EMH classes to equal the placement of nonminority children.
An observation made from the present research concerns the equal proportions of minority versus nonminority group membership found in this population of children placed EMH, attending regular schools. According to the ethnic composition of the whole district, one would expect almost 20% more nonminorities placed than minorities. This did not occur.

Within all five symptom categories there was quite a range of symptom occurrences. This range was dissimilar in rank across minorities and nonminorities. The occurrence of specific symptoms in a high percentage was the exception. The perinatal and postnatal categories occurred most frequently for both groups and the incidence of symptoms were most similar. The presence of professional diagnoses also occurred with a high frequency for both groups.

It is not surprising that the perinatal category had a high frequency of occurrences (47% and 55%). Pasamanick and Knoblock (1966) found "mental deficiency" to be one disorder significantly associated with complications during the perinatal stage. McCormack (1980) emphasizes the importance of this period as being critical since infant mortality is four times greater in this period than during the first year of life. According to Sell (1986), perinatal complications and factors are highly associated with developmental difficulties.
Perinatal scales have been developed to objectively measure risk that can be used statistically to predict abnormalities in functioning both at birth and later in infancy and childhood (Molfese and Thompson, 1985). Such scales include infant outcome measures such as the Littman and Parmelee pediatric complications scale which was discussed in an earlier chapter.

The significant occurrences of perinatal complications and factors is supported by such researchers as Costeff et al. (1983a); Hunter et al. (1980); Low, Galbraith, Muir, Broekhoven, Wilkinson and Karchman (1985) and Czeizel et al. (1980). Low et al. (1985) and Czeizel et al. (1980) separated perinatal disturbance from other 'acquired' problems (prenatal, biological disturbance and postnatal onsets) as did the present research. Low studied 364 infants prospectively to assess the relationship between fetal-newborn complications and motor/cognitive deficits. Deficits occurred in 24% of these children. Czeizel found perinatal problems in 21% of his sample.

The postnatal category also had a high frequency of occurrence (83% and 84%) across both groups. Various recurrent illnesses and demonstration of a developmental delay discovered by the family, were significantly present for both. It would be expected that retardation even mild forms, would manifest themselves during the child's first
social system and first school as well as when he begins his formal school career.

The importance is not placed on the definitive diagnosis but rather on giving the child a chance to learn how to compensate or remediate his difficulties rather than waiting for him to catch-up. This step could be viewed as an alert awareness stage.

Ingram (1969) supports the need for parent awareness in order to recognize children who are having difficulties and uses the term "diagnosis by increasing suspicion". Recognition of the specific difficulty being more important than a definitive diagnosis. The goal being to habilitate before such a diagnosis can be made.

Awareness of these postnatal symptoms or problems depends on the parents recognition of abnormalities. Ingram finds that a delay in seeking medical advice may result due to the lack of skill in recognizing problems or an unwillingness to acknowledge them and therefore appropriate interventions are not received. According to the present study, postnatal factors were found significantly which increases the necessary awareness cues, resulting in interventions.

The diagnostic category also occurred with high frequency for both groups (48% and 64%). The high occurrence in this category determined that professional input was pursued and diagnoses were made. Developmental
Delay and Mental Retardation being the top two diagnoses for both groups. There is a tendency to diagnose young children as developmentally delayed rather than mentally retarded due to the unreliability of intellectual measures for young children and also in the hopes of preventing a retardation diagnosis. This may be even more apparent in regards to minority children.

With the occurrence of a professional diagnosis, early intervention and enrichment programs are available to these children. It is a step towards defining the criteria necessary for specific programs prior to entering formal schooling. This finding appears to be in conflict with researchers such as Mercer (1970, 1973); Heber (1961) and Farber (1968) who state that mild mental retardation is not evident prior to age 5 or 6 and more common during the school age years. The present research does not support this contention due to the fact that 48% of the minorities and 64% of nonminorities in this population were professionally identified prior to school. The members in the nonminority group were identified prior to school quite a bit more than the minority group members. The significance of this is discussed later on in this chapter.

To sum up, upon examination of the various occurrences of symptoms within the five categories, the perinatal and postnatal category symptoms occurred with the highest frequency for both groups. The symptoms within
these two categories were also the most similar for both. The presence of professional diagnoses prior to school was also similar for both groups as well as occurring with high frequency.

Perinatal factors would seem to be one of the first concrete cues for parents in realizing the presence of unusual incidents. The fortunately high frequency of postnatal factors and professional diagnoses allows for the necessary early awareness and consequent professional input and programming.

Various Chi-Square analyses with regard to differences in the various categories of symptoms within two groups did not suggest statistically significant differences except for symptoms included under the congenital category. Symptoms within in this category occurred with significantly greater frequency for the nonminority groups as compared to the minority groups. Researchers such as Smith and Bostian (1964) indicate that congenital anomalies are significantly present in children with mild mental retardation. Forty-two percent of the mildly mentally retarded children in their study had congenital anomalies as well. If physiological, congenital anomalies are associated with mild mental retardation as Smith and Bostian argue, then they would be expected to occur with equal frequency for minority and nonminority groups. This was not the case for the present study.
Congenital factors could be linked to variations in prenatal care, genetic makeup and cultural-environmental factors, which may constitute areas for future investigation and the relationship to other learning problems. Consistent with popular belief nonminorities are more likely to receive early pre- and postnatal care, early medical diagnosis and consequently it is not obvious as to why a higher prevalence would be more evident in such a group. Medical data should be examined for a larger number of cases to substantiate or refute current findings in regard to dissimilarity in prevalence of congenital problems in minority and nonminority groups.

Researchers such as Mercer (1970, 1973) would have some concern over the fact that early congenital factors were present in a lesser degree for minorities and yet they were placed in higher proportions in EMH classes than would be expected. This idea is consistently supported by disproportionality research, litigation decisions and public outcry.

Looking at the relationship between age, number of symptoms, presence of professional diagnosis, length of hospital stay and IQ for two ethnic groups, there were no significant differences indicated. However, it was interesting to discover no intellectual differences within each variable. For example, the children with five or more symptoms did not differ on the general measure of
intelligence from children with no symptoms. In addition the children with a prolonged hospital stay did not vary significantly from those with average hospital stays. Neither did the children with a professional diagnosis differ from those without one in terms of an intellectual measure. Perhaps the range of intellectual functioning for the EMH population is so narrow that it does not lend itself to differentiate across variables.

Consistent with the previous analysis, an additional analysis, Discriminant Function Analysis was performed. Four variables (IQ, length of hospital stay, number of symptoms and presence of professional diagnosis) were entered to discriminate between two groups. These four variables accounted for the same amount of variance. No predictive discrimination function was found to be significant for ethnic group membership. This supports the Anova analyses suggesting similarity of the two groups in terms of these variables as well.

Despite observable similarities in symptomatology in two groups of placed children, the importance of early identification for all children for preventive as well as proper placement needs to be encouraged. The need for a continued increase in early child find efforts made more accessible for minorities is an important aspect. Some parents may lack the awareness of the problems or even if
they are aware may not know of or have access to special programs or professional contacts.

The generalizability of these overall findings should be viewed in light of a number of cautions or limitations. The number of Blacks and Native Americans included in the sample were low so the generalizability of these findings to those populations, may be somewhat questionable. Consequently, similar studies need to be conducted to examine the pattern of these etiological symptoms by using specific samples of reasonable sizes from various minorities representing our society.

From a practitioners point of view, a more standardized developmental history may be necessary. Even though the information was present in the records and there was a high degree of agreement among the interviewers in terms of content coverage and uniformity of that coverage, it is recommended that a more systematic and uniform system be established consisting of breadth and depth of developmental history to possibly alleviate some of the limitations of the interview method. Placement decisions need more objective data and by structuring the developmental history, the interview would lend itself to more objective examination.

Ciminero and Drabman (1977) conclude that there is some evidence to suggest that the more specific the interview questions, the more accurate the information
obtained. Increasing standardization within parental interviews would have the advantage of greater reliability and validity. Mash and Terdal (1982) believe that interview schedules that include disorder-specific information lead to more systematic, standardized, efficient and useful interviews including greater reliability and validity. It appears that the degree of reliability is related to the level of specificity of behaviors being described (Lapouse and Monk, 1958).

Although the primary concern of the school is to diagnose students for placement purposes and for determining the need for providing educational opportunities consistent with legal mandates, it should be noted that the home is a child's first school. Parents could be advised to stay alert for potential problems so as to become involved with enrichment programs to prevent actual placement in special classes once the child enters formal schooling. It is therefore important that early diagnosis be used to educate parents as well as to assist them in developing enriched intervention strategies so that retardation could be mediated or lessened.
DEFINITION:

Federal

"Mentally retarded" means significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior and manifested during the developmental period, which adversely affects a child's educational performance.

State

"Educable mentally handicapped" means a child who because of his intellectual development, as determined by evaluation pursuant to Section 15-1013, is incapable of being educated effectively through regular classroom instruction, but who is capable of achieving a degree of proficiency in basic academic skills and as a result of special education may become economically and socially adjusted.

CRITERIA:

In order to place a student in an EMH program, the student must be considered to be mildly retarded and because of subnormal mental development be unable to profit sufficiently from the regular school program alone. The EMH student is considered to have potential in the following areas:

1. educability in academic subjects of the school at the primary or advanced elementary grade levels.

2. educability in social adjustment to a point at which the student can get along independently in the community.

3. occupational adequacies to such a degree that the student can later be self-supporting partially or totally at the adult level.

Educational Characteristics

An educable mentally handicapped student usually achieves or functions at an IQ level of approximately one-half to three-fourths of average intelligence based on individual psychological assessment. Academic expectancies for the student will vary depending on the degree of the handicap.

Slowness in maturation may include problems in:

1. auditory memory
2. visual memory
3. generalization
4. language abilities
5. conceptual and perceptual abilities
6. imagination and creative problem solving
CRITERIA: Behavioral Characteristics
(continued) Behaviors that may be present in the EMH student include:

1. social immaturity
2. short attention span
3. poor memory
4. delayed language
5. low self esteem
6. low frustration/tolerance level
7. aggressiveness/acting out

EXCLUSIONS: The student may not be placed into EMH programs solely because of difficulty in writing, speaking, or understanding the Standard English language. If the student is from an environmental background wherein a language other than English is spoken predominately or exclusively, this shall not be considered a sufficient handicap to require special education.

PERSISTENCE: For educational purposes, mental retardation is generally considered a student's inadequacy in performing certain behaviors that are appropriate for a student's age group. The EMH student may first be identified when learning ability becomes an important part of social expectations. In most instances there are no obvious pathological conditions to account for retardation.

EVALUATION: To be considered for placement in an EMH program a student must be unable to demonstrate behavior based on intellectual functioning that is appropriate for the student's age and social situation. A test of intelligence and a measure of adaptive behavior are therefore necessary in making the determination of whether the student is educably mentally handicapped.

The primary language of the student is another factor to consider in the evaluation process. The student should be evaluated in the language in which he/she is most competent. If the student is not competent in any language the student should be given a non-verbal evaluation.

Assessment Measures
A placement in EMH programs is never made solely on the basis of a single test. A comprehensive evaluation must include the following test components:

1. Intelligence- Standardized tests of intellectual or cognitive functioning.
2. Adaptive Behavior Scale - Measures may include a developmental assessment (e.g. Vineland Adaptive Behavior Scales; AAMD-Adaptive Behavior Scale, School Edition; Adaptive Behavior Inventory for Children (ABIC), Scales of Independent Behavior - Woodcock-Johnson, etc.)

3. Education - Measures of academic performance utilizing a standardized achievement test, and/or a criterion-referenced device. Inform assessments may be appropriate for K or Pre-K children.

4. General - Data dependent upon individual case requirements:
   a. medical history
   b. developmental history
   c. physical-vision/hearing
   d. behavioral observations
   e. teacher's anecdotal records
   f. speech and language evaluation

PLACEMENT: Professional Characteristics
Following a comprehensive evaluation a professional conference will be held to determine if the student meets the criteria for placement as an EMH student. If the multidisciplinary team consensus is that the student is in need of special education, options for placement in the least restrictive environment must be considered. A recommended placement will be offered to the student when the parent/guardian is invited to the multidisciplinary conference.

Special education placement options for the educable mentally handicapped include:

   Regular class with consultant to classroom teacher
   Resource Room
   Self-contained EMH class
   Self-contained EMH class in a special school - Ganoung, Gump, Urquides, Howenstine
   Sheltered Work Experience

TERMINATION: (Change-of-Status) In addition to the annual review of the student's program, the intellectual functioning level of the student must be re-evaluated periodically. If the degree of intellectual functioning increases or if the student evidences the ability to cope with the regular academic program without specialized instructional support, placement will be adjusted according to student need.
Appendix B

Etiological Factors in Mental Retardation

A. Genetic/Congenital

1. Inborn errors of metabolism
   a. PKU
2. Chromosome disorders
   a. Down's Syndrome
   b. Turner's

B. Prenatal/Intrauterine

1. Infections
2. Placental insufficiency
3. Toxemia
4. Drugs
5. Maternal malnutrition
6. Maternal rubella

C. Perinatal

1. Hypoxia
2. Prematurity
3. Postmaturity
4. Metabolic disorders (jaundice)
5. Abnormal forms of delivery
6. Seizures

D. Postnatal

1. Illnesses/Seizures
2. Endocrine disorders
3. Metabolic disorders
4. Trauma (accidents, near-drowning)
5. Poisoning or drugs
6. Abuse
7. Developmental Delays
8. Neurological aberration
9. Behavioral aberration

E. Diagnostic

1. Mental retardation
2. Developmental Delay

F. Cultural-Familial

1. Family retardation
2. Family delays
Appendix C

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<th>YEAR OF BIRTH</th>
<th>Month/Year of Birth</th>
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</tr>
<tr>
<td>ETHNIC CODE</td>
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</tr>
</tbody>
</table>

PKU

- Down's Syndrome
- Turner's Syndrome
- Infections
- Placental insufficiency
- Toxemia
- Drugs
- Maternal malnutrition/Rubella

Hypoxia

Prematurity

Length of stay in hospital

Metabolic disorders (Hyperbilirubinemia)

Abnormal forms of delivery

Seizures

Endocrine disorders

Metabolic disorders

Trauma (accidents, inc near-drowning)/Meningitis

Poisoning or drugs

Abuse

Illness/Seizures

Developmental Delays

Neurological aberration

Parental retardation

BY

- Psychologist
- Psychiatrist
- Pediatrician
- Social Worker
- Other Mental Health Specialist
- Other physician
- Speech Pathologist
- Other

DDD services

SSI

Other services
Current Placement - Scale Used - Scores

Schools initial contact

Known Etiology.

Possible Related Problems

Diagnosis prior to school - By Whom - Scale Used
DEVELOPMENTAL HISTORY EXAMINATION SURVEY

Name (optional): ________________________
Job Title: ______________________________
Number of Years in Current Job: __________

The purpose of this questionnaire is to survey the current practises social workers generally use in obtaining information from parents required to make educational placement decisions.

This information will be utilized in a research study which intends to examine the pattern of early etiological factors prevalent in two groups of children placed in Educable Mentally Handicapped classes.

Please respond to all questions as candidly and completely as possible. Your responses, which will be of great educational value, will be held in strict confidence.

Thank you very much for your time and attention.
1. Which of the following areas are covered in your interview with parents in regards to obtaining developmental data?

<table>
<thead>
<tr>
<th>A. Genetic/Congenital</th>
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<th>no</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Inborn errors of metabolism</td>
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<td>no</td>
</tr>
<tr>
<td>2. Chromosome disorders</td>
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<td>no</td>
</tr>
<tr>
<td>a. PKU</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>b. Down's Syndrome</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>b. Turner's</td>
<td>yes</td>
<td>no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Prenatal/Intrauterine</th>
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<th>no</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Infections</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>2. Placental insufficiency</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>3. Toxemia</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>4. Drugs</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>5. Maternal malnutrition</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>6. Maternal rubella</td>
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<td>no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. Perinatal/During-Immediately After Birth</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Hypoxia</td>
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<td>no</td>
</tr>
<tr>
<td>2. Prematurity</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>3. Postmaturity</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>4. Metabolic disorders (jaundice)</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>5. Abnormal forms of delivery</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>6. Seizures</td>
<td>yes</td>
<td>no</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>D. Postnatal</th>
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<th>no</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Illnesses/Seizures</td>
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<td>no</td>
</tr>
<tr>
<td>2. Endocrine disorders-glandular problems</td>
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<td>no</td>
</tr>
<tr>
<td>3. Metabolic disorders-phys/chem changes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>4. Trauma (accidents, near-drowning)</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>5. Poisoning or drugs</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>6. Abuse</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>7. Developmental delays</td>
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<td>no</td>
</tr>
<tr>
<td>8. Neurological problems</td>
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<td>no</td>
</tr>
<tr>
<td>9. Behavioral difficulties</td>
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<td>no</td>
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</table>

<table>
<thead>
<tr>
<th>E. Professional Diagnosis Prior to School</th>
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<th>no</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mental retardation</td>
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<td>no</td>
</tr>
<tr>
<td>2. Developmental delay</td>
<td>yes</td>
<td>no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F. Cultural-Familial Aspects</th>
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<th>no</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Family retardation</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>2. Family developmental delays</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>3. Family academic difficulties</td>
<td>yes</td>
<td>no</td>
</tr>
</tbody>
</table>
2. How consistent are you in asking the same questions to obtain developmental data?

<table>
<thead>
<tr>
<th>Highly Consistent</th>
<th>Very Consistent</th>
<th>Moderately Consistent</th>
<th>Somewhat Consistent</th>
<th>Not At All Consistent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

3. In your opinion, how accurate is the information provided to you by parents, that is needed to complete the developmental examination?

<table>
<thead>
<tr>
<th>Highly Accurate</th>
<th>Very Accurate</th>
<th>Moderately Accurate</th>
<th>Somewhat Accurate</th>
<th>Not At All Accurate</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

4. Please indicate what aspects of the developmental history are covered by you when you conduct interviews with parents suspected of having Educably Mentally Handicapped children.

<table>
<thead>
<tr>
<th>All of the time</th>
<th>Most of the time</th>
<th>Half the time</th>
<th>Some of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Family History

Birth History

Physical Development

Health History

Personal-Social Development

Educational Experience
5. What specific questions are you likely to ask under each of the following categories when completing the developmental history examination involving parents?

Family History

Birth History

Physical History

Health History

Personal-Social History

Educational History
## Appendix E

### Developmental History

<table>
<thead>
<tr>
<th>Matric#</th>
<th>Birthdate</th>
<th>Ethnic Code</th>
<th>Date</th>
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</table>

### School

<table>
<thead>
<tr>
<th>Name</th>
<th>Language of Home</th>
<th>Language of Interview</th>
</tr>
</thead>
<tbody>
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<table>
<thead>
<tr>
<th>Last</th>
<th>First</th>
<th>M.I.</th>
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<th>Place of Interview</th>
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<th>Informant</th>
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### A. Family History:

### B. Birth History:

### C. Physical Development:
D. Health History:
   (Include educationally relevant medical findings)

E. Personal-Social Development:

F. Educational Experience:
   (Address the issue of educational disadvantage)

G. Identified Needs for Follow-up:
Appendix F

To facilitate use of Form , Developmental History, please consider the following. Related areas of inquiry and information should be noted with the developmental write-up.

A. FAMILY HISTORY
Number of persons in household.
Siblings by name and birth date (preferred over age).
Work schedule of parent(s)/guardian(s) considering full or part-time employment, days, nights, etc.
Primary caretaker of child, extent of family’s involvement with child.
Is family under unusual constraints.
Note basic needs in areas of food, clothing, and medical care.
Parental level of education/training.
Cultural background of family.
How long has family lived in Tucson, as well as whey they came.
Number of moves and effect on child.

B. BIRTH HISTORY
Parental age at child’s birth.
Parental health prior to conception (i.e. exposure to radiation, agent orange, drugs/medications, use of other substances).
Which pregnancy?
Mother’s health during pregnancy, labor, delivery; including such concerns as nausea/vomiting; bleeding, injuries/shock; illnesses; need for medication prescribed or not; length of pregnancy.
Labor induced or spontaneous - duration, spontaneous or manual rupture of membrane.
Complications, if any.
Delivery - hospital or otherwise.
Anesthesia, type or none.
Vaginal or Cesarean.
Presentation, head, breech; forceps or other extra medical measures.
Baby weight/length.
APGAR, if known.
Immediate or delayed cry.
Color.
Need for oxygen.
Incubator or other immediate measures.
Birth injuries, if any and where.
Birth defects.
Sucking ability (breast or formula, type)

C. PHYSICAL DEVELOPMENT
Sleep patterns (nightmares, restless, mixed day and night).
Feeding patterns and amount.
Milestones, if known; age of rollover, sit up, crawling, standing. Independent walking (note gait).
Language development, age of first understood word; string of words; clarity of articulation/production.
Toilet training for day/night/urine/BM; any problems since then such as enuresis/encopresis, age duration.
Skill levels: dress self, age, which clothing, feeding self, when and with which instrument(s).
Personal hygiene re: toileting, wiping, washing hands/face, combing hair, brushing teeth.
Independence in stair climbing (up/down), tricycle riding, hopping jumping.
D. HEALTH HISTORY
Current immunizations.
Childhood diseases and age, complications if any.
Allergies to foods, drugs, airborne particulates.
Injuries requiring emergency room or doctor visit and age.
Result of treatment(s).
Complications.
Hospitalizations, surgeries, serious illnesses and dates.
Convulsions and age.
Current medical supervision and medication (both prescribed and not).
Medical problems such as catheterization, tubes, etc.
Current vision and audiology results.
Family history of diabetes, cancer, deafness, blindness, convulsions/seizures, etc., specify family member and onset, if known.

E. PERSONAL/SOCIAL
Behavior/attitude toward siblings, parent(s), strangers.
Ask parent(s) to describe child at 2 years of age.
Interactions with others.
Temper tantrums.
Nightmares/sleep walking (age/duration).
Child's strengths.
Does child have opportunity to interact with other children?

F. EDUCATIONAL EXPERIENCES
Has child received any concerted one-on-one training (age/duration). Result.
Who worked primarily with child?
Formal in-home training received?
Child's response to this.
Parental expectations for child.

G. IDENTIFIED NEEDS FOR FOLLOW UP
Immunizations, audiology and vision evaluation.
Speech and language.
Current meds, how administered, when, by whom?
Mode of ambulation, i.e. wheelchair, walker, orthopedic shoes.
Self-help skills.
Agency contacts, medical provider, etc.

2/14/84
References


Diana v Board of Education, Civil Action No. C-70-37, (N.D., Cal., 1970).


Lilienfeld, A. M. and Pasamanick, B. (1956). The association of maternal and fetal factors with the development of mental deficiency II: Relationship to maternal age, birth order, previous reproductive loss and degree of maternal deficiency. American Journal of Mental Deficiency, 60, 557-569.


