BEHAVIORAL ASSESSMENT OF MENTALLY HANDICAPPED RESIDENTS
BY DIRECT CARE PROVIDERS

By

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This work is dedicated to Anthony and Catherine Sisbarro, my parents. With good common sense parenting, they were able to raise a youngster with reasonably good self-esteem, reasonably good social skills, and reasonably good judgment, who has developed into a reasonably successful adult. For this I am most grateful. That process was accomplished without the knowledge of the work of Gerald Patterson, Susan Campbell, Russ Barkley, Sheila Eyberg, or Berry Brazelton. For this I am in awe!
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BEHAVIORAL ASSESSMENT OF MENTALLY HANDICAPPED RESIDENTS
BY DIRECT CARE PROVIDERS

By

Michael A. Sisbarro

May 1993

Chairman: Dr. Mary K. Dykes
Major Department: Counselor Education

Traditional treatment paradigms for individuals with
profound mental and motor disabilities are changing.
Concomitant with the deinstitutionalization movement of the
mid-1970s, was the development of smaller, community-based
residential facilities. Funding and certification are
contingent upon interdisciplinary assessments and
habilitation plans. Psychological assessment procedures for
individuals with profound handicaps have been criticized.
However, the direct care providers, who are most
knowledgeable about the day-to-day functioning of residents,
do not have a data base to contribute to habilitation plan
meetings in a valid, reliable manner.

The present study was undertaken to determine whether
direct care providers could collect reliable data regarding
resident functioning on a number of behavioral dimensions,
and if reliable, would the data correlate significantly with traditional assessment measures used by psychologists.

The Behavioral Assessment of Mentally Handicapped Residents (BAMHR) scale was constructed as a downward extension of the 19 behavioral dimensions proposed and used by Bricker and Campbell (1980). The BAMHR encompasses 16 dimensions of behavior that can be observed, incorporating a 1-to-5 rating on each dimension.

Data were collected in six facilities, using 139 direct care workers, completing 845 BAMHRs on 169 residents. Interrater reliabilities ranged from .8164 to .9535. Internal reliabilities ranged from .9308 to .9694. Across all facilities significant correlations were noted between the BAMHR and Bayley (Mental), Vineland (ABC) and Cattell. Factor analytic data suggests two factors: a strong mental factor and a weaker motor factor. Higher correlations between Factor 1 (mental) and the Bayley, Vineland and Cattell, than with Factor 2 (motor) were observed, although all were significant at the .0001 level. The multivariate relationship, using the BAMHR as the criterion variable and the Bayley (mental), Vineland, and Cattell as predictors, was significant at the .0001 level across all facilities.

The data suggest that the BAMHR is a reliable, valid, cost effective alternative to the often criticized traditional assessment procedures used with individuals with profound disabilities. Further, direct care providers can collect reliable data in regard to resident functioning, and
the BAMHR would provide them the database to contribute to
habilitation planning in a meaningful manner.
CHAPTER 1
INTRODUCTION

A major change has occurred in the past 10 to 15 years in regard to services and housing for individuals who are profoundly mentally handicapped. No longer are people with profound mental handicaps relegated to large institutional settings, the pitfalls of which have been chronicled by Blatt (1970, 1973). Rather, since approximately 1975, numerous legislative acts have been passed which mandate community-based housing, community access, and education of all citizens including individuals with even the most profoundly mentally handicapping conditions (Blatt, Bogdon, Biklen, & Taylor, 1977).

The Association for Persons with Severe Handicaps (TASH) has been at the forefront in advocating for the rights of persons who are severely handicapped. Members have worked to disseminate information and formulate policy to insure "that all individuals with severely handicapping conditions gain access to dignified pleasurable lives in community based, integrated settings" (TASH, 1990). However, the needs of persons who are mentally handicapped and the nature of their disabilities are still unknown to the majority of people.

As with other degrees of retardation, people are diagnosed as profoundly handicapped in relation to two
factors: cognitive functioning and adaptive behavior. Standard scores or Intelligence Quotients for profoundly handicapped persons are below 20 or 25, depending upon the assessment instrument used (Brimer, 1990; Sattler, 1974, 1988; Snell, 1981a). As would be expected, scores in this lower end of the range are indicative of significantly limited functioning. Brimer (1990) indicated a prevalence rate of severe mental retardation in the general population of 0.4 percent. Only a small percentage (1.5%) of individuals classified as mentally retarded are considered to be profoundly impaired. A prevalence rate of .66 per 1000 members of the general society was noted by Snell (1981a). Based on this ratio, there are approximately 150,000 individuals in the United States determined to be profoundly mentally handicapped.

Due to the significantly impaired functioning level of this population, the individuals are often thought of as a rather homogeneous group. However, there is great heterogeneity within this population just as there is within a group of individuals exhibiting milder forms of retardation or with any other group defined by a range of scores (Cleland, 1979; Snell, 1981). Etiology within the profoundly handicapped population is the most varied of the groups of persons considered to be retarded (Cleland, 1979; Snell, 1981). They often present with sensory defects, skeletal anomalies and other disabilities. Their life expectancy is the shortest of any group within the population of retarded
individuals. Persons considered to be profoundly handicapped traditionally have been institutionalized earliest and are the least frequently visited and furloughed (Cleland, 1979).

Traditionally, persons considered to be profoundly mentally handicapped (PMH) have been the least provided for group of handicapped people since it was felt they could not be habilitated (Burton & Hirshoren, 1979). Although fewer persons considered to be profoundly handicapped are in institutions today, as recently as 10 years ago 82 to 90 percent were institutionalized in public and community facilities, small group homes, foster homes or hospitals (Snell, 1981a). Skill levels for institutionalized individuals considered to be profoundly handicapped range from no observed performance to independence in areas such as basic self care, mobility and general awareness (Snell, 1981). Few researchers have addressed the nonambulatory, seriously neurologically involved profoundly impaired individuals, who constitute 15 percent of the total of people labeled profoundly handicapped. This group has been labeled by Switsky and Haywood (1985) as the "absolute profoundly retarded." More recently, Sailor, Gee, Goetz and Graham (1988) referred to this population as "the most severely handicapped."

Beginning in the mid-1960s, institutions for persons considered to be mentally handicapped became the target of serious criticism (Blatt, 1970; Blatt & Kaplan, 1966). Blatt's pictorial treatise, *Christmas in Purgatory*, had a
major impact by heightening the awareness of society as to the life and needs of persons considered to be profoundly mentally handicapped. Further, by the early 1970s, class action litigation demanded institutional reforms. Deinstitutionalization was mandated as a federal policy by the Title XX Social Security legislation and by the Developmental Disabilities Act of 1975 (Blatt, Bogdon, Biklen, & Taylor, 1977). In the late 1970s, P.L. 94-103 was passed to mandate that appropriate societal support be provided for this subsection of the population.

There has been research support both for and against deinstitutionalization. Sontag, Certo, and Burton (1979); Blatt, (1966, 1970, 1973); Blatt, Bogdan, Biklen, and Taylor (1977) and Blatt, Ozolins, and McNally (1979) have supported the argument that institutions are dehumanizing and are not the least restrictive and therefore most appropriate environment for profoundly handicapped persons. They maintained that all mentally handicapped persons can make progress if provided with appropriate intervention. Ellis, Balla, Estes, Warren, Meyers, Hollis, Isaacson, Palk, and Siegal (1979) argued that the institution is the least restrictive environment for this population and that claims for effective behavior modification (habilitation) and ultimately for participatory citizenship are not founded in the literature (Snell, 1981b).

Concomitant with the deinstitutionalization movement of the mid-1970s, was the development of the smaller community-
based residential facilities (CRF) concept. A number of researchers (Blatt, 1973; Blatt & Kaplan, 1966; Blatt, Ozolins, & McNally, 1979; Wolfensberger, 1972, 1975) called for their development as an alternative to the larger less personal public residential facilities. Regardless of whether the profoundly mentally handicapped individual is served within the larger institution or the smaller community-based facility, federal legislation (Title XX of the Social Security Act, 1974) has mandated active habilitation programming. Further, funding is contingent upon meeting certain criteria regarding the individual program plan or habilitation plan (Crosby, 1976; Page, Christian, Iwata, Reid, Crow, & Dorsey, 1981). Certification and accreditation standards specify that individual programs must be based on an interdisciplinary or multi-disciplinary approach to assessment and treatment. The particulars of these approaches may differ from facility to facility but the basic level of care is specified.

Much has been written regarding the interdisciplinary approach to assessment and treatment (Beck, 1977; Bricker & Campbell, 1980; DuBose, Langley, Bourgenult, & Harley, 1977; and Orlando, 1981). The approach evolved from the medical model, and has been advocated particularly by those interested in providing intervention to meet the comprehensive needs of PMH persons. Typically, in facilities for mentally handicapped persons the professional "team approach" incorporates data observation and interventions from such disciplines as
education, medicine, nursing, occupational and physical therapy, psychology, social services and speech pathology. The individual who is profoundly handicapped is assessed independently by a professional in each discipline and a group decision is made regarding appropriate habilitation, treatment and prioritization of goals based on input from all evaluators. Disadvantages of this approach are that program implementation is isolated, delivery of services is often performed outside of the person's natural environment resulting in outcomes that may not be representative of what the client can do in the natural setting and that team members find it difficult to collaborate (Orlove & Sobsey, 1987).

A more recent service delivery team model for persons who are profoundly mentally handicapped is the transdisciplinary approach (Orlove & Sobsey, 1987). In this model, most of the team members act as consultants to one or two primary facilitators of the service provided to the person who is profoundly mentally handicapped. In this model, however, the problem of "role release" has to be overcome.

Wolery and Dyk (1984) advocated the arena approach to assessment, an extension of the transdisciplinary model. In this approach the facilitator performs the actual assessment, while other team members observe, score and record portions of their assessment tools. Team members may ask the facilitator to perform certain items or a member may assist the facilitator in item administration. This approach
eliminates redundant testing, decreases the amount of time the individual is handled and allows a more holistic view of the person resulting in a greater likelihood of team consensus in regard to treatment needs.

Often, noticeably absent from the "team" is the direct care provider. When they are present as specified in the law, they rarely contribute to the decisions being made regarding the resident since they are not trained observers of behavior and do not have a data base format to help establish equal team membership and credibility as an observer of client functioning. Yet, in most facilities for profoundly handicapped persons, direct care providers are responsible for a large portion of resident programming and are the only adults in almost constant contact with the residents. They are as knowledgeable, if not more knowledgeable, in regard to the client's typical day-to-day health, skills and behaviors as are any of the professionals on the team. Direct care providers know what the client can do, what they will do, and under what circumstances and for whom they will perform. DuBose et al. (1977) supported the importance of direct care providers, stating, "if changes are to occur through training, primary caregivers are the most likely change agents." Similarly, the importance of paraprofessionals in the delivery of services is advocated by Tucker and Horner (1977) as they stated, "any major endeavor to provide direct education and training services for the severely handicapped must materially extend to all
significant adults who come in contact with the child on a daily basis."

Raynes, Pratt, and Roses (1977) concluded that involving aides in the decision-making in institutions is the most important action that administrators can carry out to develop more individualized and responsive care in residential settings. When direct care providers are given this responsibility, they must have a more formalized method of reporting data.

The importance of the direct care provider in the service delivery system has been established. The direct care provider has more impact on the profoundly handicapped individual's daily quality of life and acquisition of skills than any other person. For example, the direct care provider, as a result of close daily contact with the client, may know client utterances and interpret them when no one else would know that intentional communication of needs had occurred. Yet, if input from direct care providers and the relevant assessment data they can contribute to the interdisciplinary meeting is not provided, it may serve to undermine the treatment process and contribute to an inaccurate assessment. Cleland (1979) wrote that the house parents and teachers within the "institution" are the most knowledgeable of individual differences within the institutionalized profoundly handicapped population. He indicated that house parents and teachers may never be fully used as they should be in program planning. Snell (1981) and
Bigge (1990) indicated that direct care providers could evaluate the effectiveness of skill acquisition procedures and could determine what skills should be introduced.

The participation and contributions of the direct care providers in the interdisciplinary process should serve to enhance the direct providers' status within the "institution," increase the zealousness with which they conduct daily resident training and may reduce the high staff turnover rate for which "institutions" have been noted.

Although, typically a stalwart as an interdisciplinary team member, the psychologist's role and contributions to the team have been questioned. Langley (1978) questioned psychologists' training and ability in regard to assessing individuals with multiple and severe impairments.

The vast majority of criticism, however, has been leveled against the assessment instruments themselves. According to Simeonsson, Huntington and Parse (1980), and Bigge (1990), the characteristics of this population make it inappropriate to conduct assessments using instruments designed for their chronologically aged peers. Compromising by using tests designed for young children or infants has been questioned (Simeonsson et al., 1981). The developmental approach also has been criticized since individuals considered to be PMH have a major discrepancy between their developmental age and chronological age; thus making traditional tests more inappropriate (Snell, 1981b). Other points of criticism involve: lack of impaired individuals in the standardized
sample (DuBose, 1981), scoring procedures not designed to yield extreme values (Simeonsson et al., 1981), inappropriateness for translation to prescriptive teaching and programming (DuBose, 1976), that lack of client cooperation in responding to items may mask real abilities (Sparrow & Cicchetti, 1978), sequences of behavior typical of nonhandicapped persons may not be relevant to individuals with profound handicaps (Snell, 1987), and that the developmental approach assumes that certain behaviors must be present before other behaviors can be taught and acquired (Snell, 1987).

Although adaptations of standardized tests have been attempted, this too has met with criticism (Sattler, 1972). Nevertheless, a number of alternative approaches have emerged which are acceptable (DuBose, 1981; DuBose et al., 1977; Dykes, 1980; Kahn, 1976; Langley, 1978).

**Statement of the Problem**

The issues to be addressed in this study can be stated concisely. Direct care providers within residential facilities for persons considered to be profoundly mentally handicapped are in almost constant contact with the residents and know the residents more thoroughly than other staff members within the facility. Yet they do not have a standardized data base by which they can contribute reliably and validly to the interdisciplinary team meeting regarding resident planning. If it could be demonstrated that direct
care providers could collect standardized, objective and reliable data in regard to resident functioning, then

1. More accurate data in regard to daily or ongoing resident functioning could be obtained;

2. Behavioral targets for individual intervention plans may be more precise;

3. The status of direct care providers within the facility may be elevated thereby minimizing the long standing turnover rate problem, and, perhaps most importantly; and

4. Resident care and functioning may improve as a result of a more stable and motivated work force who view themselves (and are viewed by others) as a valued, integral member of the interdisciplinary team.

Test instruments currently being used to assess the functioning of individuals who are profoundly mentally handicapped frequently have met with criticism. If it could be demonstrated that with a minimum of training, direct care providers could collect reliable observational data in regard to a number of health status and behavioral domains, and that these data would correlate significantly with data traditionally obtained through the use of published tests, often used inappropriately with individuals who are PMH, then a relevant ongoing data collection system could be established.
**Purpose of the Study**

The purpose of this study was to investigate whether direct care providers in residential facilities for persons with profound mental handicaps can reliably collect behavioral data in regard to resident functioning on specific quantifiable, physiological, cognitive and interactive dimensions. More specifically, if these data were collected reliably, would the data correlate significantly and positively with the data obtained on the more traditional and standardized developmental and intellectual tests administered by psychologists and traditionally required by licensing agencies.

**Research Questions**

The following questions guided the data collection and analyses:

1. What are the interrater and internal reliabilities of the BAMHR ratings within each facility?

2. What are the correlations of the Behavioral Assessment of Mentally Handicapped Residents (BAMHR) with the Bayley Mental, Bayley Motor, Cattell Infant Intelligence Scales, and Vineland Adaptive Behavior Scale, Interview Edition Survey Form?

3. What is the relationship between the BAMHR and the weighted linear combination of the Bayley Mental, Bayley Motor, Cattell Infant Intelligence Scale, and Vineland Adaptive Behavior Scale, Interview Edition Survey Form?
4. What is the underlying factor structure of the BAMHR?

5. What is the relationship of the factors obtained from the ratings of direct care providers on resident functioning and the Bayley Scales of Infant Development, the Cattell Infant Intelligence Scale, and the Vineland Adaptive Behavior Scale?

**Definition of Terms**

**Adaptive Behavior** refers to the performance of the daily activities required for personal and social sufficiency. It is age related, defined by the expectation or standards of other people and based on typical performance, not perceived ability (Sparrow, Balla, & Cicchetti, 1984).

**Deinstitutionalization** refers to the movement or transfer of mentally handicapped residents from large public residential facilities to smaller community based residences as mandated by Title XX Social Security legislation and the Developmental Disabilities Act of 1975.

**Direct Care Provider** refers to staff members employed to work in residential facilities for profoundly mentally handicapped persons whose primary job functions include direct client care such as feeding, changing, bathing, stimulation and programming. These workers also have been referred to in the literature as psychology technicians, mental health workers, and resident training instructors.

**Interdisciplinary Assessment** is the process by which persons with mental handicaps are evaluated independently by
the various professionals working in the facility (i.e., occupational therapist, physician, psychologist), and the assessment data subsequently shared at a team meeting during which goals are delineated and prioritized. This process is also known as multi-disciplinary assessment.

**Intermediate Care Facility for the Mentally Retarded** refers to a residential treatment center for clients with mental retardation that is certified to receive Medicaid reimbursement. Certification involves meeting stringent standards of health and safety, as well as providing appropriate daily intervention for clients as determined by the interdisciplinary assessment.

**Mental Retardation** refers to significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior and manifested during the developmental period (Grossman, 1983).

**Nonambulatory Profoundly Mentally Handicapped Resident** refers to those residents who use a wheelchair for mobility and who score more than five standard deviations below the mean on standardized psychometric scales, that is an IQ less than 20. These residents constitute a subset of those persons referred to as profoundly mentally handicapped and at times in the literature as profoundly mentally retarded.

**Profound Mental Retardation** is the lowest level of retardation manifested by functioning levels that are five or more standard deviations below the mean (Sattler, 1988).
Readers Note: In keeping with best and current practices, individuals who have been labeled "mentally retarded" or profoundly mentally retarded in the past, are now referred to as mentally handicapped or profoundly mentally handicapped. However, in the text, the older terms are used when quoting research that has used those terms in the study or when referring to a diagnostic category used by the American Association on Mental Deficiency or the Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-III R).

Overview of the Remainder of the Paper

The remainder of the study is presented in four chapters. Chapter 2 presents a review of the related professional literature. Research methodology and study procedures are outlined in Chapter 3. Results of the study are presented in Chapter 4, while Chapter 5 describes the implications of the results and offers recommendations.
CHAPTER 2
LITERATURE REVIEW

Historical Overview

Although individuals determined to be mentally handicapped have undoubtedly existed since the dawn of man, perhaps the first historical accounts of the phenomenon date back to 2800 B.C. and King Hammurabi. Common in the practice of Babylonian pediatrics were fetomancy (prophecy by means of fetuses) and teratoscopy (divination based on examining abnormal births) (Scheerenberger, 1983). At approximately the same time, King Tutankhamen's tomb was being decorated with ornaments among which was a statue of a female achondroplastic dwarf.

The first documents written about the mentally handicapped population were discovered in 1862 in a tomb in Thebes, Egypt, and date back to 1500 B.C. (Scheerenberger, 1983). The so-called "Papyrus of Thebes," was apparently the ancient day's equivalent of the Merck Manual as it covered numerous human ailments (Scheerenberger, 1983). References to mental retardation were oblique due to translation difficulties. A curious aspect of ancient Egyptian life was the common practice of brother-sister marriage. However, there is no record documenting a higher rate of deformed or disabled offspring as a result of this practice.
To the Greeks, beauty, health and intelligence were paramount, thus it is not surprising that two of their greatest citizens, Plato and Aristotle, wrote about mentally handicapped individuals in a negative and primitive manner. Aristotle, writing in Politics, "as to the exposure and rearing of children, let there be a law that no deformed child should live" (Aristotle, cited in Scheerenberger, 1983). Similarly, Plato in his Republic wrote "... but the offspring of the inferior, or of the better when they chance to be deformed, will be put away ..." (cited in Scheerenberger, 1983). With the rise of the Spartan state this practice continued. Population control was achieved through infanticide. Defective or suspected defective infants were thrown from the cliff of Mat Taygetus.

Hippocrates, the father of medicine, while not writing specifically about persons who were mentally handicapped, did describe microcephaly and craniostenosis and offered a cure for epilepsy. Galen, a Roman, considered to be the father of experimental neurology, postulated on varying levels of mental acuity, feeling that quality and quantity of brain substance was important (Scheerenberger, 1983). Soranus, also a Roman, and the father of pediatrics, was opposed to the treatment received by individuals who were mentally ill and mentally handicapped and espoused a more human, sympathetic approach.

As Christianity began to exert its influence in the fourth century A.D., edicts against infanticide were issued by Roman emperors. Justinian, (A.D. 483-565) a Roman ruler,
formed a comprehensive legal code which stipulated that persons who were mentally handicapped should not suffer the same penalties as others and that, in some instances, guardians, would be necessary (Grossman, 1983). Other dictums involved the formation of institutions to provide care for the poor and weak who could not care for themselves.

In the timeframe noted above, the plight of the mentally handicapped population was quite variable. Individuals who were mildly involved, especially of the slaves and poor, probably went unnoticed. Children of the wealthy received a variety of medical treatments. More severely involved persons were put to death, valued as family "fools," or sold into slavery.

During the Middle Ages, in the period of 400-1500 A.D. there was a lack of differentiation between individuals who were mentally ill and those who were mentally handicapped. Handicapped individuals were "tolerated as fools, favored as innocents or persecuted as witches" (Grossman, 1983). The approach taken was based on everyday behavior observation and was not consistent from place to place.

Avicenna (A.D. 980-1037), the most notable physician of the time, proposed treatments for such disorders as meningitis and hydrocephalus. In addition, he recognized and defined various levels of cognitive ability (Grossman, 1983). He did not, however, pursue mental retardation per se in terms of treatment.
Perhaps the first physician to distinguish between persons who were mentally ill and mentally handicapped was a Swiss named Paracelsus (1493-1541). He also was sufficiently astute to notice the great variability within each condition.

Legal definitions, such as Fitz-Herbert's in 1534, were also proposed during this time: "And he who shall be said to be a sot (i.e., simpleton) and idiot from his birth is such a person who cannot account or remember 20 pence, nor can he tell how old he is, etc., so as it may appear that he hath no understanding or reason of what shall be for his profit nor what for his loss" (Grossman, 1983).

Platter (1536-1614) was a Swiss physician who offered what was perhaps the first multilevel description of mental retardation. In 1672, Willis also discussed the heterogeneity of mental retardation with these words, "Some are unable to learn their letters but can handle mechanical arts; others who fail at this can easily comprehend agriculture; others are unfit except to eat and sleep; others are merely dolts or driveling fools" (Grossman, 1983).

In 1964, Leo Kanner, Professor Emeritus of Child Psychiatry, published a history of mental retardation in society. In that book he indicated that professionals showed no interest in mental retardation until the early 1800s. He cited Loehr's (1899) and Weygandt's (1915) works which seemed to confirm the view that the field of mental retardation was overlooked until the early 1800s.
However, in 1614 Montalto published a major medical work called Archipathologia in which he described mental retardation in terms of diagnosis, prognosis and cure. Montalto attempted to distinguish between mental retardation and mental illness. He stated that the underlying nature of the condition called "stupidity" and dullness arose from effects on the brain, birth defects, or postnatal causes. He reasoned that in regard to postnatal causes of stupidity, chilling of the brain caused the condition by inducing a thick fluid to encompass the brain. In regard to birth defects, he thought the brain was misshaped, illformed and tiny and although the condition could not be rectified, it might not effect life expectancy. He was positive, however, that "stupidity" resulting from postnatal causes could be remedied. Montalto outlined a three-stage curative process. The first stage involved a curative background and atmosphere. This included a wakeful state, and moderation of food and drink. The second stage involved repeated purgings to dispel the phlegm. The third stage involved the use of internal and external medicines, as well as the prevailing folk remedies and the use of certain precious stones.

John Locke, in the late 18th century, offered his classic distinction between mental illness and mental retardation by proposing that the mentally ill reason from the wrong ideas they put together, while "idiots" make few or no propositions and hardly reason at all (Grossman, 1983).
In the early 19th century, Jean Marc Itard, a physician, began trying to educate an adolescent "wild boy" found in the forest near Paris. The youngster was found naked, scarred, unable to speak and rocking back and forth like an animal. Although the child eventually learned to speak a few words, recognize letters, form sentences and even write, Itard felt he was unable to civilize Victor, and withdrew as his teacher. Itard did publish his work with Victor and he is often cited as being the first teacher of the mentally retarded (Blatt, 1987).

Edward Seguin, also a physician was, like Itard, interested in the education of persons who were mentally handicapped. He is considered to be the father of education for mentally handicapped persons. In 1846, Seguin defined mental retardation (then known as idiocy) as "an infirmity of the nervous system which has for its radical effect the separation of all or part of the child's organs and faculties from the regular control of his will, which frees him to his instincts and separates him from the world" (Scheerenberger, 1983). Seguin distinguished among four levels of idiocy and even advocated training and education for the most severely involved mentally handicapped individuals.

Seguin's method of education, known as the physiological method, was presented in his 1866 book, *Idiocy and Its Treatment by the Physiologic Method*. Five steps were involved in this method: training the muscular system, training the nervous system, educating the senses, acquiring
general ideas, and developing the ability to think in abstract terms and acquiring a strong understanding and practice of moral (social) precepts (Scheerenberger, 1983). Further, he was more responsible than anyone else for the development of institutions for mentally handicapped persons in the United States. He was one of seven physicians who met in 1876 in Media, Pennsylvania, to form the Association of Medical Officers of American Institutions for Idiots and Feebleminded Persons, and was elected its first president. That organization is now called the American Association on Mental Deficiency. Originally formed to address questions of etiology, statistics and management of retarded persons, its ultimate goal was to stimulate the development of institutions in the U.S. The first definition of mental retardation formulated and endorsed by this body read:

Idiocy and imbecility are conditions in which there is a want of natural or harmonious development of the mental, active, and moral powers of the individual affected, usually associated with some visible defect or infirmity of the physical organization and functional anomalies, expressed in various forms and degrees of disordered vital action, in defect or absence of one or more of the special sense, in irregular or uncertain volition, in dullness, or absence of sensibility and perception (p. 94).

During the late 18th century and throughout the 19th century, workers continued to try to delineate and differentiate medical conditions associated with retardation. The following were among those conditions identified: Cretinism, 1860; Von Recklinghausen's disease (neurofibromatosis), 1863; Lawrence-Moon syndrome, 1866; Down
syndrome, 1866; Sturge-Weber syndrome (port-wine stain), 1879; Bourneville's disease (tuberous sclerosis), 1880; and Tay-Sachs disease, 1881.

John Down was the first to provide a separate classification and comprehensive description of the Mongoloid person. He also proposed an ethnic classification system and classified idiocy (mental retardation) into three etiological categories: congenital, developmental and accidental.

The end of the 19th century and beginning of the 20th, saw two related movements develop: the development of intelligence tests and concern for the genetic factor in retardation. Dugdale and Goddard were interested in those individuals not manifesting obvious physical signs of retardation. They both worked on extensive family pedigree studies of persons who became known as "familial retarded" persons.

In 1904, commissioned by the minister of public instruction in Paris, Alfred Binet, together with his student, Theodore Simon, began work on the first genuine scale of intelligence. The scale was completed in 1905. Binet's charge was to develop a measure to differentiate those who could learn normally from those who could not, the point being that those who could not benefit from the regular curriculum due to intellectual inadequacies would be instructed in special classes. The original scale was not divided into age levels, but was interpreted according to the three levels of mental retardation: idiocy, imbecility, and
moronity. The authors felt that morons (the highest level) functioned at the 12 year level of intelligence. Binet believed that intelligence was not a fixed quantity but that the "intelligence of anyone is susceptible of development" (Binet, A., 1909, cited in Scheerenberger, 1983).

The work of Binet and Simon was brought to the United States by Goddard. In 1906, he was appointed director and developed the first psychological laboratory devoted to the study of the mentally retarded, the Vineland Training School.

In 1915, Fred Kuhlman introduced to the field of mental retardation the distribution of I.Q. along the normal curve. In so doing, he indicated that one percent of the total population would be retarded.

During the period from approximately 1920-1950 a number of workers in the field studied the variability in the day to day functioning of persons who were mentally handicapped of the same mental age or I.Q. Porteus proposed his test of planfulness (i.e., mazes) since he believed mentally handicapped individuals were discriminated against on the Binet scales due to shyness, confidence problems and speech difficulties. In 1921, he also introduced a social rating scale for the mildly involved.

The director of research of the Training School at Vineland was Edgar Doll. In 1963, he published The Vineland Social Maturity Scale. This was to be the primary measure of adaptive behavior for the next 20 years.
As it slowly became apparent that the I.Q. was not static, professionals began to use caution in making long term predictions from I.Q. test results alone, particularly for those people functioning in the upper range of retardation. The trend was to emphasize current levels of intellectual and adaptive behavior. Since the 1959 publication of the AAMD manual, both criteria, intellectual and adaptive behavior were used to define mental retardation.

In September, 1950, a national parent association for persons who had mental handicaps was formed. Currently known as the Association for Retarded Citizens of the United States, its overall goal was to promote "the general welfare of the mentally retarded of all ages everywhere: at home, in the community, in institutions, and in public, private and religious groups" (Scheerenberger, 1983).

President Kennedy, in seeking solutions to the problems of individuals who had mental handicaps, appointed a special President's Panel on Mental Retardation in 1961. Chaired by Leonard Mayo, the 26-member committee included the top experts from every field having an influence on mental retardation. They reported back to President Kennedy a year later and presented 112 recommendations emphasizing research and prevention. The recommendations included that services be comprehensive and community based, and that with federal assistance, the states and local communities be primarily responsible for financing and improving facilities for persons who had mental handicaps.
Following review of the panel's report, Kennedy addressed Congress in February, 1963, challenging them and the nation to provide comprehensive services for mentally handicapped persons. Over the next 20 years, 116 acts and related amendments were passed providing support for individuals with mental handicaps and their families in the areas of "education, employment, health, housing, income maintenance, nutrition, rights, social services, transportation and vocational rehabilitation" (Scheerenberger, 1983).

Perhaps the strongest statement regarding the rights of persons with mental handicaps to receive an education was made by Public Law 94-142, the Education for All Handicapped Children's Act of 1975. This federal law mandated local educational systems to provide a free, appropriate public education for all mentally handicapped individuals up to age 21.

**Definition of Mental Retardation**

Mental retardation refers to "significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior and manifested during the developmental period" (Grossman, 1983).

Significantly subaverage intellectual functioning has been defined as performance on a standardized individually administered intelligence test falling more than two standard deviations below the mean at or below the second percentile.
Intelligence quotients of 70 or below considering standard error of measurement meet this criteria.

Deficits in adaptive behavior related to an individual's limitations in meeting societal standards for maturation, social and daily living skills, personal independence, and social responsibility. These deficits have been determined objectively in a similar procedure as the intellectual level by such instruments as the Vineland Adaptive Behavior Scales and the AAMD Adaptive Behavior Scale.

Another salient issue in the diagnosis of mental retardation is that the onset be prior to age 18. Developmental deficits may be evidenced by slow, arrested or incomplete development which result from a number of factors including: brain damage, genetic defect, central nervous system degeneration and regression due to psychosocial factors. Mental retardation is not a disease, it is a disability. Individuals who present a similar clinical picture for the first time after age 18 have not been classified as mentally retarded (American Psychiatric Association, 1987).

**Functioning Levels**

The term mental retardation has been used to refer to a highly heterogeneous population with marked differences in functioning levels from total dependence on others for life support to almost independent functioning. The degree of deficit evidenced by the presence or absence of physical handicaps is varied also.
Presently, the American Association of Mental Deficiency (Grossman, 1983) and the American Psychiatric Association (1987) have delineated four specific levels of retardation which reflect an increasing degree of cognitive impairment, and one unspecified level.

Mild mental retardation has been defined for those individuals who have obtained intelligence quotients from 50-55 to approximately 70. As with all levels, the specific test, standard deviation and standard error of measurement are considered. This group constitutes 85% of the total population labeled as retarded.

Moderate mental retardation has been defined for those persons who have obtained intelligence quotients ranging from 35-40 to 50-55. This group accounts for 10% of the total population labeled as retarded.

Severe mental retardation has been determined for those individuals whose intelligence quotients are in the range of 20-25 to 35-40. This group constitutes 3 to 4% of the total population labeled as retarded.

Profound retardation has been determined if the individual's intelligence quotient is below 20 or 25. This group encompasses 1-2% of all persons labeled as retarded.

Unspecified mental retardation is indicated when there is a strong presumption of mental retardation, but the individual is either unable to respond to test items on standard measures or the test used does not yield intelligence or general ability values.
Incidence and Prevalence

The incidence of mental retardation in the United States is estimated to be approximately 125,000 births per year (Grossman, 1983). There is less agreement, however, with regard to prevalence, since estimates range from one to three percent of the general population or between two to six million people (American Psychiatric Association, 1987; Blatt, 1987; Grossman, 1983). This discrepancy can be attributed to the imperfect correlation between intelligence and adaptive behavior and studies that determine mental retardation based only on the cognitive aspect (Blatt, 1987; Grossman, 1983). The male to female ratio is approximately 1.5:1 (American Psychiatric Association, 1987).

Etiology

Although well over 200 causes of mental retardation have been identified (Cleland, 1979), the etiological picture has been divided into two major categories: organic or biological and nonorganic causes. Organic causes account for approximately 20% of all mental retardation (Garber & Heber, 1982). Organic or biological causes include: inborn errors of metabolism (e.g., Tay-Sachs), single gene abnormalities (e.g., tuberous sclerosis), chromosomal errors (e.g., Down syndrome), chromosomal changes (e.g., Trisomy 21), prenatal damage due to toxins, and prenatal and perinatal problems such as prematurity, and hypoxia. Ninety percent of biologically based mental retardation is prenatal in origin and is apparent at birth or in early infancy. This type of
retardation in which there is central nervous system damage is fairly distributed across socioeconomic and racial groups.

The nonorganic causes account for about 80% of the retarded population and include those who do not present obvious gross pathology of the central nervous system (Garber & Heber, 1982). Since this type of mental retardation is noted in disproportionate numbers in the economically disadvantaged, a myriad of factors in the social-cultural environment have been considered to be causes. This type of retardation is often referred to as cultural familial mental retardation (Garber & Heber, 1982). The great majority of individuals in this group are normally appearing and usually function within the mild range of retardation.

Although the basic cause of this type of retardation is unknown, a number of factors have been implicated including: genetic (i.e., fragile X), inadequate prenatal and infant health care, as well as decreased levels of social stimulation. The label of "cultural familial retardation" has been used to imply that at least one or more family members is retarded and that there is no evidence of biological or organic factors that may be contributory to the condition.

**Profound Mental Retardation**

"They have eyes but they see not; ears, but they hear not; they have no intelligence and no consciousness of pleasure or pain; in fact, their mental state is one of entire negation." This is the conceptualization of
profoundly mentally handicapped individuals offered by Tredgold in 1937 in *A Textbook in Mental Deficiency*.

Fortunately, the study of individuals with profound mental handicaps has progressed significantly since this description was offered. Charles Cleland, a psychologist who worked with the institutionalized population of severely and profoundly handicapped individuals, was a pioneer in the movement to educate and train these individuals.

As noted above, only approximately one percent of all persons with mental retardation are noted to be profoundly handicapped; therefore, the generally accepted prevalence rate of PMH is .66 per 1000 members of the general population (Snell, 1981). Based on this ratio, approximately 150,000 individuals in the United States would be categorized as profoundly mentally handicapped. As with other degrees of retardation, individuals who are profoundly mentally handicapped have been identified by significantly impaired functioning in cognitive and adaptive behavior. Standard scores range up to 20 or 25 depending upon assessment instrument and definition employed (Grossman, 1983; Sattler, 1988; Snell, 1981).

Since these scores refer to rather limited functioning levels, individuals who have been determined to be profoundly mentally handicapped are often thought to be a rather homogeneous group. However, there is great heterogeneity within this population just as within the other milder forms of retardation (Cleland, 1979; Snell, 1981). Further,
profoundly mentally handicapped individuals present the most varied etiological picture of the four levels of retardation (Cleland, 1979; Snell, 1981). Compared with the other levels of retardation, profoundly mentally handicapped persons more often present with severe sensory deficits, skeletal anomalies, speech impairments, medical fragility and a high death rate. In one study involving 32,691 cases, Cleland and Patton (1965) learned that the average age of death was 38, and that the major cause of death was pneumonia (36.5%). Up to 40% of profoundly mentally handicapped persons are either bedfast or semiambulatory.

Research concerning persons who are profoundly mentally handicapped has been diverse in terms of topics studied. The most frequently researched areas are stereotypic behavior, modeling - imitation learning, problems with eating and drinking, self-stimulation, and self-injurious behavior (Berkson & Landesman-Dwyer, 1977; Cleland, 1979). Interestingly, the first graduate seminar concerning persons determined to be profoundly mentally handicapped was taught in 1965 by Dr. Charles Cleland.

Individuals with profound mental handicaps have been found to exhibit some unusual behavioral problems which often impact negatively upon health. Pica (the ingestion of nonedible objects such as dirt, paint, and paper having no nutritional value) has been identified in the PMH population, as have coprophagy (the ingestion of feces) and rumination ("the act of voluntary regurgitation, remastication and
swallowing again") (Cleland, 1979). Bruxism (teethgrinding) can precipitate dental concerns for the population. Self-stimulatory behavior, although not necessarily harmful, could be the in case of head banging and eye poking. Other self-stimulatory behavior such as head weaving and hand waving are not health threatening. The frequency of dental and oral hygiene abnormalities is greater in profoundly handicapped persons as compared to persons with other levels of retardation. Etiology can be related to the general increase in skeletal abnormalities in persons who are profoundly mentally handicapped, and an increased percentage of convulsive disorders has been identified in the profoundly handicapped population necessitating that numerous individuals take anti-convulsant medication.

**Medically Fragile Profoundly Handicapped Individuals**

Extreme definitional problems have plagued the literature with reference to individuals with profound mental handicaps. The fact that there seems to be no published criteria that differentiates between individuals with "profound" multiple handicaps from "severe" multiple handicaps prompted Sailor, Gee, Goetz and Graham (1988) to note that no adequate definition of the population appears in print and that research studies do not adequately define their population. These problems seem to continue as Sailor et al. (1988) have used the term "the most severely handicapped" while Guess, Mulligan-Ault, Roberts, Struth,
Seigal-Causey, Thompson, Bronicki, and Guy (1988) have used "the most profoundly handicapped" to define this population.

The TASH Subcommittee on Services for Students with Multiple and Profound Handicaps (1987) currently uses the following definition provided by Rainforth (1982) to describe this population:

These unresponsive students do not demonstrate understanding of daily routines, gestures, or other bases for communication, although they may grimace or groan with discomfort. They show no recognition of even significant persons in their lives. They may sit or grasp objects, but they engage in no purposeful movement. They demonstrate little if any observable response to noise, movement, touch, odors, or other stimuli. When compared to normal children, these students frequently lack the abilities even newborn infants possess. They rarely function higher than the six-month level in many developmental areas. While some likes and dislikes may be suggested, true reinforcers that increase the occurrence of a behavior are elusive. Unresponsive, profoundly retarded students may be of any age and may live in any setting. They may have received attention ranging from virtual neglect to intensive programming."

(p. 33)

Switzky and Haywood (1985) have delineated two distinct groups of profoundly mentally handicapped individuals based on measures of their functional abilities. The first group—the "relatively profoundly retarded"—have been considered to be older, less organically damaged and have some degree of ambulation, communicative function and self-help skills. The second group—the "absolute profoundly mentally retarded"—have been observed to lack all adaptive behavior skills and exist in a medically fragile state. This group was felt to be so medically impaired that constant medical services would be required merely to sustain life.
The overwhelming severity and multiplicity of these individuals' needs often left them the last to be served, the least likely to be served and most subject to abuse (Stark & McGhee, 1984). The PMH population has presented the highest level of challenge to medical professionals, to allied health personnel, and to their caregivers, from ideological, maintenance, and programmatic perspectives. Initially, professionals were hard pressed to apply developmental and normalization principles to these individuals. However, applied scientists such as Bijou, Bricker and Lindsey, and the success of such programs as ENCOR (Eastern Nebraska Community Office of Retardation) supported the idea that with proper environmental stimulation and formal training, even the most profoundly mentally handicapped children with primary medical needs were capable of change (Stark, McGhee, & Menolascino, 1984; Switzky & Haywood, 1985).

In 1972, the original concept of ENCOR was to provide a "maintenance of life" service focusing on keeping the person alive. It was the experience of ENCOR professionals that even the most medically fragile infants would either not be maintained at all, or they would improve. Improvement necessitated dealing with the developmental growth needs of the person. The aim of the project (renamed Developmental Maximization Unit) was to attain maximum development in any individual regardless of the nature and extent of the disability.
Empirical research, however, on developmental gains resulting from training or programming with profoundly handicapped persons is somewhat limited. Hotte, Monroe, Philbrook, and Scarlata (1984) investigated developmental changes in two levels of profound retardation: low profound (L.P.) with Social Maturity Quotients (SMQ) on the Vineland Social Maturity Scale (VSMS) between 0-9, and high profound (H.P.) with SMQ's between 11-19. After 3 years of court mandated programming, the H.P. group gained 11 months on the VSMS, while the L.P. group gained only 1 month. The authors concluded that developmental gains could be achieved through "programming with any level of retardation including the most profoundly impaired, but the gains are minute with the lower levels of profound (L.P.) retardation." No mention was made however, of the possible lack of sensitivity of the assessment instrument or the appropriateness of teaching techniques.

In a study conducted by Ulicny, Thompson, Favell, and Thompson (1985), profoundly handicapped women made substantial progress toward independent eating when provided with a strictly controlled program taught by specially trained individuals. However, when the techniques were transferred to the direct care staff, gains were not maintained. Thus, the authors questioned whether the persons were not capable of learning or perhaps were the "programs" uneducating.
Other researchers have indicated that individuals considered to be medically fragile, profoundly multiply disabled were able to learn basic movements and sensory behaviors to increase competence with functional activities (Sailor et al., 1988; Sandler, Thurman, Meddock, & DuCette, 1985), while other researchers have found similar results with similarly handicapped infants and young children (Campbell & Stewart, 1986; Correa, Paulson, & Salzberg, 1984; Dunst, Cuishing, & Vance, 1985; Hanson & Hanline, 1985).

History of Intensive Care Facilities for Mentally Handicapped Persons in Florida

In 1977, the Florida State Legislature passed into law the "Retardation Prevention and Community Services Act." This legislation for the developmentally disabled citizens of Florida caused the emphasis to be shifted from an institutional-based service delivery system, to one that was community-based. It was the thinking of the legislature that the present state programs—namely the Sunland Centers, were too costly, ineffective in allowing clients to reach their potential and were "in fact debilitating to a great majority of clients" (Hodges Report, 1984). The mandated reorientation in treatment placed emphasis on programs which had the potential to prevent or reduce the severity of retardation and other developmental disabilities. Priority was given to the development and implementation of community-based residential placements, services, and treatment programs which would enable individuals to reach their
maximum potential, live close to their own community and be removed from, perhaps, unnecessary institutional placements.

With funds approved in 1977 and 1979, small residential facilities were constructed to provide homes for 818 of the 948 developmentally disabled clients living in the Tallahassee and Orlando Sunland Centers. Each facility was a four-bedroom home of about 3500 square feet, which provided residential services to eight clients. To contain the cost of 24-hour nursing coverage, three homes of similar size, design, function, and staff were co-located or "clustered" on a site. In addition to the four client bedrooms (two clients to a room), each house contained a living room, dining room, two large client bathrooms, a nursing office with a medical isolation room, an activity room, several staff offices, kitchen, and several staff bathrooms. These facilities were constructed in keeping with Intensive Care Facility for the Mentally Retarded (ICF/MR) standards since operational costs were to be covered under the Medicaid funding program.

The Tallahassee and Orlando Sunland clients were assessed in July of 1980 to ascertain the number of developmental-medical clients that would require placement in clusters with 24-hour nursing care. Of 948 people in these facilities, 312 were labeled "developmental-medical" and would require placement in clusters with 24-hour nursing coverage, 506 were classified "developmental nonambulatory" and were to be placed in clusters with partial nursing
coverage and 130 clients were higher functioning clients who could be served in other facilities.

Due to difficulties in finding suitable construction sites, the construction of the clusters for the developmental-medical clients was begun first. The Laurel Hills Cluster in Orlando opened first in May, 1981. In the fall of 1981, the Hodges Cluster in Jacksonville opened. By May of 1983, four more clusters, located in St. Petersburg, Tallahassee, Lantana, and Bartow had become operational.

Data on Residential Facilities

For 100 years the United States government has either collected or contracted with private agencies to collect demographic data on people residing in public residential facilities for mentally handicapped persons. The total population of mentally handicapped people in institutions ranged from a low of less than several thousand in 1880, to a high of 194,650 in 1967 (Lakin, Krantz, Bruininks, Clumpner, & Hill, 1982). There have been steady population decreases so that in fiscal year 1980-1981, the population was 128,472 (Scheerenberger, 1982), while in 1982, the population decreased to 118,982 (Lakin et al., 1982; Scheerenberger, 1982). The average number of residents per institution ranged from a low of 200 in 1880, to a high of more than 1500 by 1960 (Lakin et al., 1982). Since then, the population per facility declined to a 1980 low of about 600 residents per facility.
An increase in the number of community-based residential facilities for mentally handicapped persons paralleled the decrease in persons living in state operated or public residential facilities. In 1982, a census was conducted by the University of Minnesota in regard to 24-hour, 7-day-a-week residential facilities for mentally handicapped persons in the United States. The 15,633 residential facilities surveyed housed a total of 279,095 residents (Hauber, Bruininks, Hill, Lakin, Scheerenberger, & White, 1984). Almost 53% lived in publicly operated facilities, while 47% lived in privately operated facilities. The largest category of facility was the group home residence accounting for 49% of total facilities and 84.3% of total residents. Group residences housing 64 or more residents accounted for the largest percentage (58.2%) of the total residential population.

The number of ICF/MR certified beds increased from 98,097 in 1977 to 138,738 in 1982. Most of the change in the number of ICF/MR's (577 in 1977, 1,854 in 1982) occurred among small facilities (1 to 15 beds) which increased from 188 facilities with 1710 residents to 1,202 facilities with 9,714 residents (Hill, Lakin, & Bruininks, 1984) in the 5-year period.

Cost per resident per year has soared since data was first kept in 1915. Calculated in 1967 dollars, the lowest cost per resident per year was less than $1,000 from 1915 to 1940 and just over $10,000 in 1980 (Lakin et al., 1982).
Uncorrected for inflation and in real dollars, the 1980 cost per resident was $25,000 per year. Costs per resident in ICF/MR facilities ranged from $41.96 per day in 1977 to $79.53 in 1982. For the first time, in 1984, the nationwide per diem for each resident exceeded $100 (Braddock, Hemp, & Howes, 1986). The reasons for these enormous costs are many and include more seriously impaired residents, improvements in staff working conditions and pay, program costs, health care, as well as increased staff to client ratios. Public group residences (64 or more) were on the average the most expensive due to the highly disproportionate numbers of severely and profoundly retarded residents (Hauber et al., 1984).

Staff-to-resident ratios have ranged from a low of 1:7.5 in 1930, to a high of 1:1.5 in 1980 (Lakin et al., 1982). In a national survey of large public residential facilities conducted by Epple, Jacobsen, and Janicki (1985) the national total facility staff-to-resident ratio was 1.60:1. The direct care staff-to-resident ratio was 0.82:1, while the clinical staff-to-resident ratio was 0.32:1. In Florida, the total staff-to-resident ratio was 1.85:1, while direct care staff-to-resident ratio was 1.09:1.

Epple et al. (1985) in a national survey of public residential facilities indicated that 56.6% (50,962) of the residents were "profoundly mentally retarded." However, across all residential facilities the proportion of people with "severe/profound mental retardation," according to data
collected by Hill et al. (1984) increased from 59.7% (147,934) in 1977, to 60.5% (147,419) in 1982. In 1982, the residents were slightly older and more severely handicapped than in 1977. The proportion of "profoundly retarded" residents in small group homes increased from 4.4% in 1977, to 9.5% (42,018) in 1982 (Hill et al., 1984).

The increase in the numbers of severe/profound mentally handicapped residents being served in foster care and small group homes seemed to demonstrate that people functioning within this level of retardation did not necessarily require institutionalization, but served to provide many good examples of community-based care for persons with severe handicaps.

**Issues in Deinstitutionalization versus Institutionalization**

The belief that institutions are detrimental to client growth and development dates back to the early studies on maternal and sensory deprivation. Studies, such as those conducted by Spitz (1945, 1949) and Bowlby (1951) strongly indicated that institutionalization resulted in cognitive and affective deficits. Similar studies by Sheels and Dye (1939) and Sheels (1966) also support the conclusion that institutionalization retards development. Phillips and Balthazar (1979) noted declines in communication skills during prolonged institutionalization.

As is often the case, however, a number of other studies conducted approximately within the same timeframe reached opposite conclusions. Researchers such as Balla, Butterfield
and Zigler (1974); Clark and Clark (1954); Yando and Zigler (1961), and Zigler, Balla, and Butterfield (1968) found increases in I.Q. and cognitive development for individuals who had been served in institutions.

Since 1974, when the President's Committee on Mental Retardation presented its recommendations, the view has been that persons with mental retardation could continue to grow and develop given proper environments. Institutionalization has become a less frequent occurrence. Further, while it had been generally believed that those persons presenting complex medical management and training problems could best be served in large institutions, there was evidence that smaller community-based programs could serve this complex population equally as well (Conroy, Efthimiou, & Lemanowicz, 1982; Fiorelli & Thurman, 1979; Hill et al., 1984; Menolascino & McGhee, 1981; Menolascino, McGhee, & Casey, 1982; Schroeder & Henes, 1978).

In addition to the issue of improved developmental outcome as a result of deinstitutionalization, the topic of adaptive behavior has been studied by a number of investigators. Aanes and Moen (1976) found increases in independent functioning, language development, and socialization for mentally handicapped individuals living in group homes. Thomas and Carey (1980) documented gains in language development, domestic activity, and social skills when relocating a group of mentally handicapped women from an institution to a community home. Witt (1981) found that when
two groups of mentally handicapped clients were relocated from a large to a small living unit, the lower functioning group demonstrated increases in independent functioning, socialization, and vocational activity, while the higher functioning group showed improvements in language development and socialization. Conroy, Efthimiou, and Lemanowicz (1982) noted increases in AAMD Adaptive Behavior Scales total score for deinstitutionalized subjects, while the control group remained unchanged. Similarly, in a study conducted by Kleinberg and Galligan (1983), mentally handicapped clients assessed using the Adaptive Behavior Scale and Minnesota Developmental Programming System improved in language development, domestic activity, responsibility, and social interaction, when moved from a large developmental center to one of three small community residences. Data were taken at 0, 4, 8 and 12 months post transfer.

Additional studies by Conroy, Efthimiou, and Lemanowicz (1982); Jones, Conroy, Feinstein, and Lemanowicz (1984); and Sandler, Thurman, Meddock, and DuCette (1985) also supported the notion that relocation to more normalizing settings promotes the development of client's adaptive behavior. The first two studies used subjects matched on the basis of age, sex, retardation level, and I.Q. Jones et al. data (1984) were collected two years post relocation and still showed higher adaptive behavior scores on the Behavior Development Survey than their matched counterparts who remained institutionalized. The data collected by Jones et al. went
further than similar studies by indicating that those clients who were relocated to the community received more services than those who remained institutionalized. Further, the annual mean public costs of those in community facilities was $40,284, while the mean for those remaining institutionalized was $47,170.

Only a few researchers investigating the effects of relocation on development have used severely or profoundly mentally handicapped individuals. MacEachron (1983) investigated the adaptive behavior of 289 "profoundly retarded residents" who were assessed after one year of being randomly assigned to a "newer, more normalizing residence" (community placement) or one providing more custodial care (large institution). The adaptive functioning of the residents in the more normalizing community facility was higher after one year with the social aspects of the facility being the best predictor of higher adaptive functioning.

Similarly, after 10 months in an ICF/MR, 95 "severely and profoundly retarded" former residents of a large state institution significantly improved their adaptive behavior as measured by the Vineland Social Maturity Scale (Johnson, 1981). Gains were attributed to improved environmental conditions and increased training opportunities.

Contradictory evidence was provided by Silverman, Silver, Sersen, Lubin, and Schwartz (1986). They investigated 193 "nonambulatory, multiply disabled and profoundly retarded residents" living in either a moderately
sized residential facility or a small community program. No evidence was found to indicate that habilitation was greater for residents in the smaller community program.

The issue is not as simple as that residents of institutions are always served inappropriately and suffer, or that residents in small community-based housing are necessarily served appropriately. King, Raynes, and Tizard (1971) distinguished between resident-oriented and institution-oriented management practices in describing facilities of any size. Institution-oriented practices were described as promoting rigid structure, smooth operation, and catering to staff convenience. Resident-oriented practices were said to recognize and fulfill individual client needs regardless of staff convenience. A number of researchers (MacEachron, Zober, & Fein, 1985; Tjosvold & Tjosvold, 1983) have supported the conclusions reached by King et al. that there is a very strong positive relationship between client adaptive behavior and resident-oriented management practices. MacEachron et al. (1985) indicated that staff members do play important roles in effective client treatment, but their role is dependent upon the general treatment environment—both physical and social—being conducive to client and staff performance. When the philosophy of management supported more custodial-institutional care, client care and behavior were likely to deteriorate.

Perhaps the most incisive review of the research on relationship of size of institution to quality of care was
conducted by Balla (1976). He concluded that "on the average" residents in the smaller institutions (i.e., community-based) received better resident care services than in the larger institutions. Thus, on the average, the smaller the setting, the better the care. However, he also noted that there were wide variations among the smaller facilities on all quality of care dimensions. Further, across all sizes of institutions, the type of institution (i.e., how it is managed), rather than its size, might have been the factor affecting direct client care services. Thus, while the smaller community care settings might be more apt to provide therapeutic conditions, that was not guaranteed, in the same way that large institutions originally designed to provide more custodial care, may have more resident-oriented management practices.

In studying both maladaptive and developmental behavioral functioning, Balla (1976) noted that "the similarities are much more striking than the differences," across residents in institutions of all sizes. Thus, "institutional" behavior patterns of clients may exist regardless of facility size.

**Direct Care Staff**

Direct care staff are by definition those individuals employed by the residential facility to provide direct client services such as feeding, bathing, changing, and programming. These staff members have such titles as: resident training
instructor, psychological technician, attendant, or direct care provider.

The problem of staffing institutions for the retarded began in the mid-1800s when Jacob Guggenbuhl opened Abendberg, the first institution for the retarded (Kanner, 1964). Scheerenberger (1976) indicated that direct care staff account for 75% of facility personnel, and at least half of facility budgets, which in 1976, was 2 billion dollars.

The stability of direct care staff has been noted to be a key element with respect to facility programming and the attainment of individual habilitation goals (Zaharia & Baumeister, 1978). Baker, Seltzer, and Seltzer (1977) identified staff related issues as "the most crucial factors determining the success of programs." Since approximately 120,000 direct care staff are employed by public and nonpublic residential facilities (Lakin, Bruininks, Hill, & Hauber, 1982), the high turnover rate for these staff members is perhaps the most serious problem faced by those who provide residential care (Bensberg & Barnett, 1966; Lakin & Bruininks, 1981; Zaharia & Baumeister, 1978b, 1979).

Studies have reported turnover rates ranging from 0 to 200 percent (George, 1980; Zaharia & Baumeister, 1979), resulting in high public expense (George, 1980; Zaharia & Baumeister, 1979) and detrimental effects on the quality of care, training, and programming (Balla, Butterfield, & Zigler, 1974; Bersani & Heifetz, 1985; King, Raynes, &
Tizard, 1971; Maslach & Pines, 1977; and McCormick, Balla, & Zigler, 1975). The average replacement costs per direct care provider across three state operated facilities was $1,562.71 (Zaharia & Baumeister, 1978). Further, one of the facilities had an annual personnel budget of 9 million dollars which translated to replacement costs of $412,000. What was not included in the replacement cost figures, because it is not calculable, is the direct effect of employee turnover on care and habilitation of residents. Further, the increased health risk and cost, due to the stress of a frequently changing resident environment and decreased predictability for the resident, can not be underestimated.

Lakin, Bruininks, Hill, and Hauber (1982) obtained a stratified national random sampling of 75 public and 161 nonpublic facilities in regard to yearly direct care staff turnover rates. In public facilities, the turnover rates ranged from 2 to 157%, with a mean of 32.8%, while nonpublic facility turnover rates ranged from 0 to 400%. The mean was 54.2%. Nonpublic facilities housing 1 to 6 residents had the highest turnover rate: 86.7%. George and Baumeister (1981) in studying 21 randomly selected community residential facilities in Tennessee found an overall turnover rate of 73% per year.

Not only have turnover rates been a major concern, but absenteeism as well. In a national sampling of direct care providers in state operated residential facilities, Zaharia and Baumeister (1979) noted that absenteeism ranged from
21.6% to 144% per year with an average of 80.4%. In one case, absenteeism cost the facility $214,000 annually.

Some researchers have indicated that management practices are responsible for high employee turnover and absenteeism in institutions. Cleland and Dingman (1970) noted that professional and administrative personnel provide poor models for direct care staff. (In fact, Cleland (1964) (cited in Butterfield, 1967) indicated that professional turnover rates in facilities for the retarded, were often greater than that for the attendants.) Cleland and Dingman also indicated that institutional administrators relied on outdated and ineffective organizational strategies. Blatt (1970) and Scheerenberger (1975) reached similar conclusions. Klaber (1969) reported that 76% of the direct care providers he interviewed blamed the administration for problems that led to employee withdrawal. George and Baumeister (1981) indicated that a major factor contributing to high turnover rates was lack of effective methods to orient, integrate, and maintain new staff members. The lack of time and money spent on staff preparation and training was revealing and supported by empirical data gathered by O'Conner and Sitkei (1975) and Bruininks, Hauber, and Kudla (1980).

The hope that preservice and inservice training programs would reduce turnover has been expressed by Butterfield (1967) and Blatt (1970). The Scandinavian model of national preservice training centers has been successful by a) raising and professionalizing the status of direct care providers,
b) screening out leavers, and c) improving the quality of employees who stay (Zaharia & Baumeister, 1978).

Job enrichment programs have been used successfully in industry since the 1950s. Cleland and Peck (1967) and Sarata (1975) suggested a number of methods to improve job satisfaction among staff members in institutions such as educational sabbaticals, role variation, and formalized training functions.

Zaharia and Baumeister (1978b) have noted a critical initial employment period for employees in institutions which lasts approximately 2 to 3 months. First identified by the Tavistock Institute researchers in the 1950s, the successful passage of this period is crucial to avoid a constantly changing work force and maladjusted workers. Zaharia and Baumeister felt that the developmental foundation laid by management to assimilate new workers was of preeminent importance and that those facilities that integrate workers successfully would be better able to manage turnover (Zaharia & Baumeister, 1979b).

Level of compensation is another factor often cited as a major source of dissatisfaction leading to turnover (Ganju & Mason, 1982; George & Baumeister, 1981). In a study of 500 direct care providers randomly selected from three state facilities in Tennessee, Zaharia and Baumeister (1979a) found lower job satisfaction, especially with respect to pay, than those workers in industrial settings. Zaharia and Baumeister (1979b) felt that low salaries had two major effects on the
work force: a poorly motivated group of people accepting work in the facilities, who often viewed their job as temporary employment.

Lack of client progress, or slow client progress has been identified as another possible source of direct care provider dissatisfaction leading to turnover (Sarata, 1977). Further, persons functioning within the lower levels of retardation may be the least satisfying residents with whom to work. Zaharia and Baumeister (1978) found a correlation of -.55, indicating the more severe the level of retardation, the higher the turnover rate. However, George and Baumeister (1981) found exactly the opposite result. Similarly, Silver, Lubin, and Silverman (1984) presented data indicating no differences in attitudes between staff members who served very profoundly mentally handicapped individuals and those who worked with a similar, but less impaired population. Both groups of staff members were generally satisfied with the caregiving aspects of the job and felt that they were attempting to provide a positive environment for their clients.

Sarata (1974) questioned direct care and professional personnel and found the primary factors involved in low job satisfaction were extensive resident contact and lack of resident progress. Persons in high contact positions (aides, attendants) were less satisfied than those individuals in low contact positions (psychologists, supervisors), especially with respect to the issue of client progress. Employees
tended to attribute lack of client progress to some fault of the staff or agency, or as inevitable. Those staff who viewed slow progress as inevitable felt a higher level of satisfaction with the agency, while those who attributed slow progress to incompetence or poor motivation in other staff members became embittered, uncooperative, and communicated less with other staff. This lead to unmet client needs. Sarata (1974) recommended that administrators should help staff members to understand that client progress will be slow, but will occur in small increments. They should discuss openly employee frustrations concerning client progress and direct high contact employees to spend a portion of their work week in nondirect client related activities such as developing programs, planning strategies, etc.

Of course, turnover rates can have a desirable effect on resident functioning and in the operation of the institution if those staff who leave are considered incorrigible, burned out, abusive, or incompetent (Munro, Duncan, & Seymour, 1983). However, Lakin, Bruininks, Hill, and Hauber (1982) and Cope, Grossnickle, Covington, Durham, and Zaharia (1978) made the point that those staff who voluntarily leave are seen as good employees.

Cope et al. (1987), investigated the supervisory ratings of 144 present and 144 previous employees of a large residential facility for mentally handicapped persons. There were no differences in performance ratings between those who stayed and those who resigned voluntarily. Those employees
who were dismissed, however, had significantly lower ratings than those who remained employed.

Lakin et al. (1982) came to the conclusion that of the 908 public facility employees on whom exit ratings were obtained, 16% were rated excellent, 66% average, and 18% poor. Thus, employee turnover was not seen as a method of getting rid of ineffective workers.

Scheerenberger (1975) noted that direct care providers were so overwhelmed by custodial duties that they had little time or energy to meet their other roles as parent surrogates and trainers. This resulted in demotivation and demoralization. Zaharia and Baumeister (1979a) agreed, indicating that direct care providers regarded their work and pay as unrewarding and suggested that their jobs be redesigned to increase autonomy and to be more enriching.

More recently, Slater and Bunyard (1983) investigated attitudes among 92 primary care providers in a large privately operated community residential facility. They determined that the majority of the primary care providers (47.6%) viewed their basic responsibility and primary role as maintenance: housekeeping, bookkeeping, and meeting residents life-sustaining needs. Training responsibilities, such as developing resident skills, were viewed as a basic responsibility by only 28.1% of those surveyed.

Holburn and Forrester (1984) investigated job satisfaction in a cross-section of employees at a state facility for mentally handicapped persons. They reported
that decision frequency, satisfaction with materials, resident contact, and clarity of instruction were most important to the direct care providers. Raynes, Pratt, and Roses (1977) found that attendants' frequency of participation in building meetings was highly correlated with their sense of involvement in decision-making. Further, this sense of involvement was positively related to the quality of care they gave the residents. They felt that attempts to involve direct care providers more thoroughly in decision-making that directly related to their work "is the single most important action that administrators can carry out to develop more individualized and responsive care in residential settings." (p. 575)

Direct care staff are often expected to participate and contribute to interdisciplinary team meetings regarding residents and to help to develop individual education and habilitation plans. Although it is assumed that their participation in these meetings is important due to their extensive direct client contact, researchers have been unable to document the actual nature and quality of these interactions. Further, there is generally a dearth of information available on this subject.

Bailey, Thiele, Ware, and Helsel-DeWert (1985) investigated the nature of interactions and level of participation for 154 participants (professionals, para-professionals, and direct care staff) during 23 team meetings. Significant differences were noted between direct
care staff and professionals in areas such as: seeking and contributing information, suggesting goals, providing feedback, accepting responsibility, disagreeing comfortably, and evaluating alternatives. Further, although the direct care staff felt their presence in the meetings was important, they did not feel free to actively participate, contribute information, or disagree. Thus, they offered fewer suggestions and provided less feedback.

Direct care staff have been told that they have an important role with increased responsibilities rather than just custodial care. In fulfilling their responsibilities they must work with various professionals who have a superior education, and observation system. Furthermore, these professionals bring to the team meeting a data base derived from various norm and criterion referenced tests. The direct care providers only offered opinions, although based on direct observation, but not documented in a standardized objective manner. This clearly placed them in a less credible and thus subordinate position.

There have been studies to indicate that direct care staff participation in team decision-making has been related to quality of care received by institution residents (Holland, 1973) and increasing participation has proved a successful method of enhancing staff performance (Burgio, Whitman, & Reid, 1983). In fact, Sluyter and Cleland (1972) concluded from their study of job satisfaction among residential care employees that higher order needs (i.e.,
recognition) were more salient to job satisfaction of the workers than factors lower on the hierarchy of needs (i.e., salary).

There is a paucity of research on direct care staff participation in interdisciplinary team meetings in residential facilities. The same is true for parent or "client advocate" participation although the results are similar. In a random national survey of 138 residential facilities, 96% of the respondents viewed parental involvement as desirable in the IEP process, however, only 32% of the facilities had parental involvement. Only 43% of parents actually participated in multidisciplinary review meetings; while 24% of the respondents thought parents should not be involved in program monitoring activities (Hourcade & Parette, 1986).

**Assessment Procedures with Profoundly Handicapped Persons**

The American Association of Mental Deficiency has defined profound mental retardation as performance on standardized intellectual and adaptive behavior measures which fall more than five standard deviations below the mean. This usually means standard scores below 20 or 25. There are individuals who fall within this range who ambulate and verbally communicate, albeit in a rather limited manner. This paper, however, is focused upon those individuals labeled "absolute profoundly mentally retarded" by Switzky and Haywood (1985) and addressed above.
In reviewing the literature on assessment procedures for profoundly handicapped persons it was difficult and at times misleading due to the tendency for researchers to miscategorize or incorrectly match test score to degree of retardation. This phenomenon has been noted by Cleland (1979) and Taylor (1980). Taylor, in reviewing 566 studies appearing in the American Journal of Mental Deficiency and Mental Retardation, noted 20% of the studies incorrectly classified subjects in terms of AAMD level of retardation. Only 28% of the studies used terminology consistent with the AAMD system. In studies employing severely and profoundly retarded subjects, only 50% reported tests used. Taylor (1980) felt that this reflected the feeling of a lack of appropriate test instruments for the profoundly handicapped population.

In a study designed to investigate which tests are used in the assessment of severely/profoundly handicapped individuals, Sigaroos, Cole, and McQuarter (1987) found that there is a lack of statistically adequate tests for this population, but that technical inadequacy is not a deterrent in the selection of tests. In reviewing test records of severely and profoundly handicapped individuals aged 6 to 21 from five metropolitan school districts, it was noted that the Bayley Scales of Infant Development and the Cattell Infant Intelligence Scale were used 25% of the time. This was true despite the fact that approximately 95% of the individuals to whom the tests were administered were outside
the age norms of the test. The Bayley Scales was the second most frequently used instrument and was the only test used in all districts.

According to Bigge (1982), Duncan, Stardellati, Maheady, and Saints (1981), and Simeonsson, Huntington, and Parse (1981), the characteristics of this population make it inappropriate to assess them using instruments designed for peers of their same chronological age. Compromising by using tests designed for young children or infants negatively effects the validity of the scale (Bayley, 1970; Hatcher, 1976; Simeonsson et al., 1981). This developmental approach is also criticized since as profoundly handicapped persons age, the discrepancy between their developmental age and chronological age increases making such tests more and more inappropriate (Snell, 1981b). Most older profoundly mentally handicapped persons have splinter skills at higher levels that will never be identified using a developmental profile.

Other points of criticism have included: lack of impaired individuals in the standardization sample (DuBose, 1981), scoring procedures not designed to yield extreme values (Simeonsson et al., 1981), examiner ability and comfort with the population, inappropriateness for translation to prescription and programming (DuBose, 1978), and the lack of cooperation on the examinee's part may mask true abilities (Sparrow & Cicchetti, 1978). Sattler (1988) also criticizes the use of developmental scales since they do not take into account the fact that profoundly handicapped
individuals have limited opportunities to develop and refine concepts. Their development does not progress like "normal" young children. Snell (1987) also recognizes the inappropriateness of the "normal" developmental sequence as it relates to persons with profound handicaps since sequences of behavior typical of nonhandicapped persons may not be relevent to individuals with profound handicaps and that the developmental approach makes the incorrect assumption that certain behaviors must be present before other behaviors can be taught and acquired. Campbell and Stewart (1986) also caution on the use of developmental milestone assessments, especially within the motor domain, since these techniques do not assess abnormal tone and movement patterns. Further, teaching set "normal sequences of development" to individuals with disabilities may not be appropriate. Adaptions of standardized tests have been attempted and they too have met with criticism (Satter, 1972).

Despite the above noted concerns, the Bayley Scales of Infant Development and other infant development tests are frequently used standardized measures for severely brain-damaged and "profoundly mentally retarded" individuals (Meyers, 1973; Stancin, Reuter, Dunn, & Bichett, 1984; Van Etten, Arkell, & Van Etten, 1980). Further, a number of researchers have noted that various infant intelligence/developmental scales are highly reliable predictors of later intellectual development when given to a population of multiply handicapped and "retarded" individuals.
(Illingworth, 1961; Keirnan & DuBose, 1974; Knoblock & Pasamanick, 1967; McCall, Hagarty, & Huelburt, 1972; Oppenheimer, 1965). Others have noted that standardized intelligence tests do have predictive function and do correlate with one another even at the low end of the distribution (Baumeister, 1965; MacAndrew & Edgerton, 1964b; Ross & Boroskin, 1972). Although Sattler (1988) has criticized the use of standardized, norm-referenced and developmentally based scales in reference to persons with profound handicaps, he also feels they can contribute to the assessment process since the mental age or developmental age can provide an index to place the person's performance at an approximate developmental level. Further, the failure or passing of individual items can provide information about what the person can or cannot do.

Since the construction and standardization of the Bayley Scales of Infant Development are well accepted (Anastasi, 1976), many researchers have described their nonambulatory profoundly mentally handicapped population using mental ages based on Bayley Mental Scales performance (Haskett & Hollar, 1978; Landesman-Dwyer & Sackett, 1978; Remington, Foxen, & Hogg, 1977). Meyers (1973) and Naglieri (1981) recommended the Bayley Scales as potentially useful for the assessment of "severely and profoundly retarded children."

Whitely and Krenn (1986) investigated the possible utility of the Bayley Scales for selecting nonambulatory profoundly mentally handicapped students for intervention
programs and the ability to predict performance on learning tasks from Bayley Mental Scale performance. They found that the relative difficulty of the items are similar for "nonretarded young children and nonambulatory profoundly retarded persons." Additionally, there was a positive relationship between Mental Scale scores and the probability of successful conditioning. They concluded that the test may have applicability for assigning students to programs based on conditioning principles in applied settings.

Similarly, Reuter, Archer, Dunn, and White (1980) noted that the Bayley Scales were useful in discriminating developmental age differences within the 1-year level with profoundly mentally handicapped children and could be useful for educational and habilitation planning. Further, significantly different behavioral characteristics in terms of quantity and quality were noted with handicapped children whose Bayley scores were above and below 5 months of age.

Despite the above apparent commendations, Haskell and Bell (1978) in reviewing the use of the Bayley Scales to assess the development of profoundly retarded individuals stated, "On any single administration of the Scale, then, the examiner may not be able to secure a representative sample of an individual's behavior, and will, if anything probably underestimate the repertoire" (p. 347). Whitely and Krenn (1986) also noted the low reliability of some Mental Scale items and suggested multiple test sessions.
Regardless of the evaluation instrument used, professional assessment time is very valuable (i.e., expensive) and does not ordinarily lend itself to examination of the brain-damaged individual who has a slow and labile response level. Thus, an adequate opportunity to demonstrate the complete range in their behavioral repertoire is rarely provided.

Numerous other factors impinge on examiner assessment time and increase the difficulty and ultimate cost of the evaluation. The severe physical impairments often seen in the profoundly handicapped population, imply the need to evaluate muscle tone and reflexes. Because the severely spastic or quadriplegic individual has very limited ability to move in order to respond to items, this listless appearance may be misinterpreted as a lack of interest in learning (Finney, 1975). Since these individuals lack communication skills, and thus, have no speech and no point response, they are especially difficult to evaluate. Regardless, DuBose (1981) noted that few examiners are proficient in nonverbal communication. Self-abusive and other aberrant behavior will increase assessment time and necessitate consistent use of the individual's behavior management program during the evaluation. Other problems confronting the examiner include: dealing with seizures and the deleterious effects of medications, extremely short attention spans, breathing problems, proper positioning, and handling adaptive equipment.
Not only is examiner assessment time an issue, but training and competence as well. Langley (1978) questioned psychologists' training and ability with respect to assessing individuals with multiple and severe impairments. Irons, Irons, and Maddux (1984) surveyed the perceived competence among psychologists who evaluate students with severe handicaps. Of the 285 professionals responding, 90% held at least a master's degree. Almost 60% had no university training in dealing with individuals with severe handicaps, while only 10% had 6 or more semester hours. Eighty-three percent indicated that they would like more training. The three areas that responding individuals felt least competent to assess included: normalizing muscle tone for testing, testing for primitive reflexes that might interfere with the evaluation, and assessing feeding skills. Less than 15% felt competent in these areas.

Other methods of evaluation have been investigated in order to improve upon the validity and reliability of assessment procedures for profoundly handicapped persons. Stancin, Reuter, Dunn, and Bickett (1984) examined the validity of caregiver information regarding the developmental status of severely brain-damaged children. Developmental information on 106 severely brain-damaged children was obtained via caregiver (teacher and parent) report based on the Kent Infant Development Scale. These results were then compared to the results obtained from the Bayley Scales. Age estimates obtained using the two measures were significantly
positively correlated. In a second study designed to assess differential validity of caregiver reports, the scores of Kent Infant Developmental Scales completed by mothers yielded higher developmental age estimates than did similar scores obtained from teacher ratings using the Kent Scales. Reasons for the discrepancies in results include the fact that mothers have more experience with their children over a longer period of time, have a more extensive behavior sampling on which to draw conclusions, and have more opportunity to observe developing behavior and adaptive behavior skills in a natural setting. The overestimation/lack of objectivity argument was believed to be not valid since items were presented in random order with respect to age norms and domain content, thus disallowing consistent overestimation. Further, raters were not asked to predict behavior (i.e., how the child would respond) but rather report whether a behavior had been observed or not. Since the efforts of caregivers have a direct impact on whether profoundly handicapped persons learn, an effective way to ensure maximum caregiver effort and participation would be to involve them directly in the initial assessment and subsequent planning process.

The lower administrative costs of caregiver assessments permit more frequent assessments thus facilitating treatment, planning, and evaluation. Numerous other studies have used direct care providers as sources of developmental data with both handicapped and nonhandicapped children (Coligan, 1976;
Frankel, 1979; Gradel, Thomson, & Sheehan, 1981; Knobloch, Stevens, Malone, Ellison, & Resemerg, 1979; Thompson, 1980; Thompson, Currey, & Yancy, 1979). Gradel, Thompson, and Sheehan (1981) found that the developmental assessment data collected by mothers of handicapped infants and children were highly correlated with information from more traditional data sources such as teachers and diagnosticians. Mothers and teachers agreed on an average of 91% on all Developmental Profile items. The percentage of agreement on the Bayley Mental and Motor Scales was 76% and 75%, respectively. When differences occurred it was usually in the direction of maternal overestimation. However, professional underestimation also occurred due to: limited observation periods or time, limited instrument sensitivity, and inherent variability of the children.

Using direct care providers in the data collection maximizes the ecological validity of any assessment process by allowing information to be gathered from a variety of sources (Irvin, Crowell, & Bellamy, 1979; Thompson, 1980). Further, since caregivers, like mothers, have more opportunity to observe behavior in a wide array of circumstances, they can report on adaptive behavior that is unavailable to psychologists, but that is crucial to providing an accurate behavioral/developmental description. It should be expected then, that a profoundly mentally handicapped person's performance on a "professionally" administered test would earn a lower score than what the
caregiver predicted. Caregivers' knowledge of the profoundly mentally handicapped individual is predicated on cumulative observations of demonstrated competence in a natural setting over time and is not bound by limited samples of behavior, often in a nonnatural setting, as happens during a formal "testing situation."

Since profoundly mentally handicapped individuals develop slowly, an evaluation should be able to measure very small changes in behavior, and emerging behaviors which occur inconsistently and infrequently. Since behavior change occurs slowly, it may take quite some time for an individual to "pass" a skill on a norm- or criterion-referenced test due to a lack of test sensitivity. This is true even though progress has been made in that skill area. Thus, progress would not be reflected in the test score and intervention effects would go unnoticed.

Profoundly mentally handicapped individuals exhibit a limited range of behaviors as well as a response topography that varies from day to day and hour to hour. They perform in one setting but not in another; perform only for one particular person or only after considerable delay or prompting. The behavior may be performed partially or in a distorted manner. Thus, tests that employ only a binary scoring (pass/fail) procedure lose important information about the person being evaluated. Such a system does not discriminate between an individual who made no response, as opposed to the one who was partially correct or inconsistent,
as either response would cause the individual to fail the item.

Alternatives to the binary scoring system exist. The "Likert Scale" allows for judgement on the part of the examiner and allows for choices along a continuum such as "always," "frequently," "occasionally," "never." Test reliability can be effected by subjectivity, but can be guarded against by operationally defining the choices.

The multidimensional scoring system is another alternative. Using this method, each response is evaluated along a number of dimensions such as "degree of completeness, promptness, clarity, need for prompts" (Cole, Swisher, Thompson, & Fewell, 1985). This system is sensitive to small variations in responses and may provide information about patterns of responses that would be useful in intervention.

Cole et al. (1985) combined the two alternative scoring procedures in the evaluation of 10 profoundly mentally handicapped individuals (mean age 12 years, 2 months). The results were that while a binary scoring system could not detect significant differences in mean pre-post test scores, the graded multidimensional system delineated those differences in performance at a statistically significant level. The graded multidimensional scoring system was more sensitive to change along every dimension measured and thus more sensitive to small changes in behavior. Sensitivity
to small behavioral changes has been deemed necessary in determining the effectiveness of intervention and in determining what and how to teach.

**Assessment Procedures**

Since first included as a diagnostic criteria for mental retardation in the 1959 manual of the American Association of Mental Deficiency, there have been numerous undertakings to assess the adaptive behavior status of mentally handicapped persons. The prototypical effort - the Vineland Social Maturity Scale (Doll, 1935, 1965) was later revised and entitled the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 1984). Other efforts such as the Cain Levine Social Competency Scale (Cain, Levine, & Freeman, 1963), The Balthazar Scales of Adaptive Behavior (Balthazar, 1973) and the Behavior Rating Inventory for the Retarded (Cicchetti & Sparrow, 1978), while useful for assessing adaptive behavior in most levels of retardation, did not seem appropriate for assessing the very profoundly mentally handicapped functioning at the lowest levels. Similar arguments used as mitigating factors against standardized I.Q. measures were offered. Cicchetti and Sparrow (1978) indicated that factor loadings were quite low, the subscales had low reliability, the range of standardization was restricted, and there were difficulties in scoring and administration. While the Behavior Rating Inventory for the Retarded improved on a number of these dimensions, the scale
still required 45 to 90 minutes to administer. Scoring time was additional.

Adaptive behavior has most often been assessed by administering a rating scale to a third party who is supposed to be familiar with the person being evaluated. Direct testing has also been employed to measure adaptive behavior, although only two fully developed instruments are available: the Social and Prevocational Battery (SPIB) and the dressing-undressing subscale of the Balthazar Scales of Adaptive Behavior (Halpern, Irvin, & Landman, 1979). However, both approaches are designed for individuals functioning within the moderate to mild range of retardation with the SPIB assessing such skills as banking, health care, and survival reading. Clearly then, this approach would not be applicable for the assessment of profoundly mentally handicapped persons.

In a study conducted by Halpern, Irvin, and Landman (1979) the rating scale approach to assessing adaptive behavior was compared with the direct testing method. Although both approaches were found to be valid, the direct testing method was found to be superior. The authors recommended that direct testing should play a stronger role in future assessment of adaptive behavior. Repp (1978) also felt that indirect assessment should be backed by direct observations such as on the living unit and should not be restricted to environments that occur once or twice yearly such as in the psychologist's testing room. Fewell (1983)
indicated that assessment information should be functional and relevant to the individual's natural environment. And, that any assessment should include those skills that are instructional targets.

Berkson and Landesman-Dwyer (1977) have also noted that the full potential of adaptive behavior scales for client training or evaluation has not been realized. This is perhaps due to administrative problems within institutions or the inadequate training of personnel in the appropriate use and interpretation of results.

Powers and Handleman (1984) believe that to the extent that treatment decisions are guided by observable behavior and those data are recorded and preserved, accountability is increased. The rewards in pursuing such an accountable course are powerful in our litigious society.

In a rather thorough review of instruments designed for the assessment of mild to profound mental retardation, Hogg and Raynes (1987) present a compendium of tests and key test information. Included were such informational items as main uses of the instrument, standardization population, response format, who can administer the instrument, special training required, administration time, etc.

Several notable approaches were omitted from the Hogg and Raynes review. These include the Mirador (1987), the assessment of biobehavioral states (Guess et al., 1988), and the approach developed by Bricker and Campbell (1980). Mirador is an assessment and planning guide for people with
profound functional deficits and complex health care needs. The stated purpose of the Mirador is to provide caregivers "a view of the whole person with an emphasis on activities and changes of the past year." Because individuals with profound deficits and health care needs have few recognizable responses - the Mirador was designed to recognize all responses as possibly offering developmental potential.

The guide is divided into two booklets. The first, Physical Care, assesses eight areas of life activity and includes such domains as: food and nutrition, movement and mobility, rest and sleep, and bathing. Social Development, the second booklet, assesses such social domains as: personal growth, communication and interactions, and relationship. The assessment booklets are well over 200 pages in length, addressing 13 different domain areas and identifies needs for care and training.

The assessment of biobehavioral states in individuals who are profoundly handicapped stems from similar research conducted with infants. Guess et al. (1988) have delineated six behavioral states: asleep-inactive, asleep-active, drowsy, awake-inactive-alert, awake-active-alert, and crying-agitated. These biobehavioral state measures were offered as a possibly viable assessment tool that may improve intervention strategies with individuals who are profoundly handicapped.

Bricker and Campbell came to realize that with multiply and profoundly handicapped students, the conventional
multidisciplinary assessment procedures, as well as standardized and nonstandardized testing, tended to yield results that were nonfunctional, nonmeaningful, and much too costly. Their alternative was based on the knowledge that individuals, due to long term institutionalization, lack of instruction and severe stereotypic behavior could not be assessed through standard means. Nineteen dimensions were developed along which behavior could vary and be directly influenced through intervention and education.

The Bricker and Campbell scale assessment dimensions were: surviving and thriving, tonicity, visual acuity, auditory ability, motor quantity, motor quality, oral motor feeding, oral motor vocalization, mobility, manipulation, consequence preference, primary circular reactions, secondary circular reactions, social responsiveness, compliance, memory, production of intentional chains, motor imitation, and verbal imitation. Each dimension was rated using a 5-point scale where a scale point value approximated 1 standard deviation. A point value of 1 was used to indicate that the performance or behavior (on the dimension being evaluated) was in the normal range in reference to an age norm or a more general scale of human performance. A point value of 2 indicated a mild deviation from the norm or standard and for which some specialized intervention might be necessary to make some progress. A moderate degree of deviation (approximately 1 to 2 standard deviations from the mean) was designated by a point value of 3. A point value of
4 indicated a deviation of a severe degree denoting an average of 3 standard deviations from the mean on that dimension. Falling more than 4 standard deviations from the mean and indicating a profound handicap was a point value of 5.

The scale was used to signal severe problems in any of the dimensions in which special education or intervention was required. The number of areas yielding severe/profound ratings delineated the depth and breadth of intervention services required.

Summary of Literature Review

Traditional treatment paradigms for those individuals with profound mental handicaps are changing. The current trend is that these individuals should reside in small community-based residential facilities, rather than be housed in large institutional settings. Current trends also indicate that client age and severity of the handicapping condition is increasing.

Federal legislation mandates active habilitation programming for residents of these facilities. Funding and certification are often contingent upon multi or interdisciplinary assessment and meeting certain criteria regarding the habilitation plan. The direct care provider is most responsible for the day-to-day activity of the residents, knows the residents best, and yet, while a member of the interdisciplinary team, rarely contributes in a meaningful way to the decision-making process. The direct
care provider does not bring to the team a data base format to help establish equal team membership.

The problems of massive turnover rates, high absenteeism, low pay, and low morale have plagued direct care providers thus presenting major challenges to facility administrators. Those administrators have been well aware that resident quality of life and functioning level are contingent upon the aforementioned problems being solved. Since the direct care providers know the residents better than any other staff group within the facility, using the information they possess based on observations in the natural setting, in a standardized fashion, would allow for a more ecologically valid and thorough assessment. The direct care providers, by having a standardized, objective data collection system, will be able to contribute in a meaningful way to the interdisciplinary team meeting, and have equal team membership. By being an integral, contributing member of the team, their perception of themselves and how they are perceived by the "professional" staff may improve. They may view themselves as a more valued part of the staff, which may result in a more stable and motivated work force, thus improving resident care and functioning. Standardized assessment procedures frequently utilized with individuals who are profoundly handicapped were questioned, as well as psychologists' ability to assess these individuals.

The present study was conducted to determine whether direct care providers could collect reliable data in regard
to resident functioning on a number of behavioral dimensions. Furthermore, if reliably collected would this data correlate significantly with the more traditional assessment measures used by psychologists?
CHAPTER 3
METHODOLOGY

This study was designed to investigate whether direct care providers, who are relatively untrained in data collection and behavior observation procedures, and who work in facilities for individuals who are profoundly mentally handicapped, can reliably collect data on resident functioning levels. This study was based on an experimental, structured behavior rating scale. Further, if reliably collected, do the data correlate significantly and positively with standardized psychological assessments obtained on the same residents.

Selection of Participants for the Study

Population and Sample

There are several hundred profoundly handicapped individuals residing in a number of intermediate care facilities for the mentally retarded (ICF/MR) in the northeast and north central Florida area. The primary researcher initially contacted the Health and Rehabilitative Services director for the District Four area in order to receive permission for access to the facilities under her auspices. During the initial contact, the general scope, purpose, and importance of the research was reviewed. Subsequently, a copy of the complete proposal was provided.
Once permission was granted to contact the facility directors, the research project commenced.

Nine facilities were contacted. The primary researcher initially spoke either with the facility director or director of research. Again, the general scope, purpose, and importance of the research was discussed. This was followed up by either a detailed letter describing the research, or a copy of the proposal. Eight of the facility directors expressed interest in the research and a face to face meeting was scheduled with either the facility director, research director, or direct care providers. Having accomplished this, seven of the directors agreed to participate, while the eighth expressed disinterest. This facility was later compelled to participate under orders from the HRS supervisor. Ultimately, however, participation was minimal and the data not used.

Each of the seven directors who agreed to participate employ a number of direct care providers. These staff were inserviced as to the nature, scope, importance, and relevance of the research study (see Description of Participant Training, pg. 91). All direct care providers were invited to participate in the study providing they met the following criteria: (a) they had been employed by the facility for at least 3 months (Zaharia & Baumeister, 1978b) and (b) they had been working with the particular resident(s) selected for at least one month. Each direct care provider who chose to participate in the study completed The Behavioral Assessment
of Mentally Handicapped Residents (BAMHR) for each resident given the above criteria.

Although one of the seven facilities was inserviced twice, the director and staff eventually declined to participate. Three of the facilities required a second inservice due to very high turnover rates - a major problem discussed in the literature review. Ultimately, 139 direct care providers in six facilities participated in the research.

**Selection of Residents Who Are Profoundly Mentally Handicapped**

Although it was initially believed that all residents in the above cited facilities were profoundly mentally handicapped, this, in fact, was not the case. Residents residing in the facilities under study encompassed all levels of mental retardation. Some residents who were labeled profoundly mentally handicapped by the facility, turned out to be otherwise, while some residents who were not judged (by the facility) to be profoundly mentally handicapped, were later judged to be so, upon record review.

All residents for whom permission to review their file was obtained from their guardian, HRS, or facility director, were judged eligible for the study, if they were profoundly mentally handicapped. A diagnosis of profound mental retardation is made if standard scores of less than 20 are obtained on standardized intellectual, developmental, and adaptive behaviors measures. All residents who participated
in the study obtained standard scores of less than 20 on at least one measure of development. (The computation of exact scores less than 20 is essentially meaningless.) In addition, all participants in the study received scores on a developmental measure of 25 months or less, with the vast majority (95%) of residents receiving scores of less than 12 months on the various developmental measures. Ultimately, 169 residents participated in the study. Interrater and internal reliabilities were based on data from 169 residents. Due to lack of permission to review psychological files or developmental scores too high for study purposes, only 144 residents' data were used for all analyses. They ranged in age from 14 to 69 years (\(M = 33.9\) years). Mental ages on the Bayley (mental portion) ranged from 1 month to 30 months (\(M = 8.2\) months) and on the Bayley (motor portion) from .1 month to 13 months (\(M = 6.6\) months). Cattell Infant Intelligence Scale mental ages ranged from 1 month to 35 months (\(M = 8.1\) months). Vineland Adaptive Behavior Scale, Adaptive Behavior Composite mental ages ranged from 1 month to 43 months (\(M = 10.1\) months). Vineland Communication Domain mental ages ranged from 1 to 30 months (\(M = 8.5\) months). Vineland Daily Living Domain mental ages ranged from 0 to 57 months (\(M = 14.5\) months). Vineland Socialization Domain mental ages ranged from 1 to 67 months (\(M = 7.8\) months). Vineland Motor Domain mental ages ranged from 1 to 29 months (\(M = 7.6\) months).
Description of Assessment Procedures

Four research instruments were used in this study. The Behavioral Assessment of Mentally Handicapped Residents (BAMHR) was completed by the direct care providers, while the Bayley Scales of Infant Development, the Cattell Infant Intelligence Scale, and the Vineland Adaptive Behavior Scales were administered by the facility psychologists within the past several years in keeping with current facility practices.

The BAMHR is a downward extension and expanded version of the index of 19 behavior dimensions proposed and used by Bricker and Campbell (1980). Two behavior dimensions contained in the original index (Production of Intentional Chains and Motor Quantity) were omitted to decrease redundancy. The Bricker scale dimensions of (a) Primary and (b) Secondary Circular Reactions were condensed into one dimension in the BAMHR for simplicity.

The BAMHR encompasses 16 dimensions of behavior that can be observed in each resident. The dimensions are (Bricker & Campbell original title in parentheses): Health Status (Surviving and Thriving) (1), Muscle Tone (Tonicity) (2), Vision (Visual Acuity) (3), Hearing (Auditory Ability) (4), Movement Patterns (Motor Quality) (5), Vocalization (Oral Motor Vocalization) (10), Verbal Imitation (11), Reinforcers (Consequence Preference) (12), Social Responsiveness (13), Following Directions (Compliance) (14), Primary Circular
Reaction and Secondary Circular Reaction (15), and Memory (16). (See Appendix A)

The original index incorporated a 5-point scale for which each scale point value approximated one standard deviation. A point value of one indicated that the behavior on the dimension rated fell within normal limits relative to an age norm or a more general scale of human performance. A value of 5 indicated a profound handicap being 4 or more standard deviations below the average.

The BAMHR is ordinal and does not incorporate standard deviation units. Each dimension is rated from 1 to 5, with 1 representing the lowest level, nonobservability or absence of the skill, and 5 the highest skill level. Generally, the BAMHR contains two types of items: quantitative and qualitative.

Quantitative items were written for dimensions involving developmental skills or sensory abilities. These included such dimensions as Vocalizations and Hearing. Such dimensions were arranged with the highest level of skill indicated by a scale value of 5, approximating a 12-month developmental attainment. Lower scale values 4, 3, and 2 were arranged in decrements approximating 3 months. This was accomplished according to skills or behaviors typically evident at the 9, 6 or 3 month levels on various developmental tests, scales, or generally accepted child development milestones, e.g., Bayley Scales of Infant Development (Bayley, 1969), Developmental Assessment for the
Severely Handicapped (Dykes, 1980), and Hearing in Children (Northern & Downs, 1984).

Qualitative items were written for such dimensions as Muscle Tone, Health Status, and Reinforcers. Corresponding developmental levels could not be ascribed to these dimensions since they are not components of standardized child development measures. They were designed to measure less to greater ability/health/receptivity, etc. in an ordinal paradigm involving behaviors calling for a qualitative judgment on the rater's part. These behaviors could be attributed to the resident as a result of observing the resident in the natural environment and the rater's knowledge of the particular resident.

Further, a task analysis/skills hierarchy approach guided the process. Thus, skills, tasks, or states were artificially divided into their component parts. Components judged easiest, or requiring less effort were assigned a lower scale value; whereas the demonstration of all component parts was assigned the highest scale value. Residents are required to demonstrate all skills or behaviors at a particular level on a particular item in order to be rated at that level. Thus, a resident receiving the highest scale point value (5) on a particular item should be able to demonstrate all the behaviors at that level. Receiving a rating at this level or scale point value subsumes all other skills for the item.
The primary concern in the development of the BAMHR was ease of observation, use, and implementation by the raters (direct care providers). Behaviors frequently observed in individuals considered to be profoundly mentally handicapped, as a result of prolonged institutionalization, were ranked higher in the ordinal scale than those behaviors or skills that "normally" would appear at a higher developmental level. These behaviors involved those that are more highly valued and/or more frequently required and trained within the institutional setting. For example, in the dimension Feeding, the use of both fingers and spoon appropriately during eating receives a higher scale point value than the use of spoon alone because the use of fingers is encouraged at the lower developmental levels.

**Nationally Normed Assessments**

**Bayley Scales of Infant Development**

The Bayley Scales of Infant Development was developed by Nancy Bayley in 1969 to provide clinicians and researchers with an adequate means to assess the developmental progress of infants in the first two and one-half years of life. The Bayley Scales involve a three-part evaluation of the infant, with each part making a contribution to the overall assessment.

The Mental Scale was designed to measure a range of cognitive processes as well as sensory perceptual acuities and discriminations. Memory, learning, problem solving, vocalizations and verbal communication and understanding are
also assessed (Bayley, 1969). Results are expressed as the Mental Development Index which is a standard score with a mean of 100 and a standard deviation of 16 (Anastasi, 1976, 1988).

The Motor Scale was designed to measure the child's ability to control, maintain, and integrate muscle tone and muscle coordination patterns required for sitting, ambulating, and hand use. The Motor Scale results are also expressed in standard score units called the Psychomotor Development Index with the same mean and standard deviation as the Mental Scale (Anastasi, 1976, 1988).

The Infant Behavior Record, completed after the Mental and Motor Scales have been administered, assists the examiner in assessing the child's qualitative social orientation and responsiveness toward the environment. This portion of the evaluation is subjective and does not yield any psychometric "scores," rather, an assessment of the child's personality in regard to emotional and social behavior, attention span, persistence, and goal directedness is obtained (Anastasi, 1976).

It is clearly stated in the manual that "the Scales have limited value as predictors of later abilities, since rates of development for any given child in the first year or two of life may be highly variable over the course of a few months" (Bayley, 1969, p. 4). Bayley indicated that the Scales' primary value is in establishing the child's current status and any deviation from normalcy. The Scales also
provide a basis for identifying mental and/or motor retardation.

The standardization sample consisted of 1,262 "normal" children in the age range from 2 through 30 months. The 1960 United States Census provided the data from which the sample was stratified on the basis of sex, race, urban-rural residence, and educational level of head of household.

The Bayley Scales manual contains split-half reliability coefficients for the Mental Scale ranging from .81 to .93 (depending upon age level) with a median value of .88. Reliability coefficients for the Motor Scales have been established as ranging from .68 to .92 with a median value of .84. The standard error of measurement for the Mental Scale ranges from 4.2 to 6.9, while the range is 4.6 to 9.0 on the Motor Scale.

One concurrent validity study using the Bayley Scales and the Stanford Binet Intelligence Scale is presented in the manual. The correlation coefficient between scores obtained on the two instruments by the total sample was .57. Bayley believed that due to the restriction in range of scores especially on the Binet, that this value indicated a substantial degree of agreement between the Mental Scales and the Binet.

For the purposes of this study only the Mental and Motor Scales were used to determine the developmental functioning levels of the residents. The Infant Behavior Record was not used since it does not yield psychometric scores.
Cattell Infant Intelligence Scale

The Cattell Infant Intelligence Scale was developed by Psyche Cattell in 1940. The Scale purports to assess the developmental and intellectual progress of infants and toddlers from 2 months to 30 months. The author designed the test to be a downward extension of the Stanford Binet Form L. In fact, Stanford Binet items are included in the Cattell Scale at the 22 to 30 month level. Thus, by using the Cattell at the younger ages and the Binet at the older ages "one continuous scale from early infancy to maturity has been attained (Cattell, 1940). While focusing on language development after 2 years, below age 2 it assesses such skills as: alertness, attentiveness, motor coordination, imitativeness, and visual discrimination (Palmer, 1970).

The standardization of the Scale was based on 1346 examinations using 274 children at 3, 6, 9, 12, 18, 24, 30, and 36 months of age. However, the feeling was that the Scale "may be used with only a little less accuracy with children between these ages" (Cattell, 1940). It was felt by the author that the average social level of the group was probably above that of the general population.

The test manual contains information in reference to reliability and validity. However, in many instances that data are based on correlational studies using relatively few individuals. Although the split half reliability coefficient is .56 at 3 months, it improves substantially to .88, .86, .89, .90, and .85 at 6, 9, 12, 18, and 24 months.
respectively (Cattell, 1940). Validity data as compared with the Stanford Binet Form L at 36 months also varies considerably but achieves respectability above 12 months (Cattell, 1940; Palmer, 1970). While at 3 months the correlation is .10 with the 36-month Binet, it rises to .34 at 6 months, .56 at 12 months, .71 at 24 months, and .83 at 30 months (Cattell, 1940). Thus, the author feels that the validity and reliability values from about 15 months on are nearly as high as the reliability and predictive values of most intelligence tests for school age children.

Scores are derived based on a mean of 100 and the ratio method is used for determining the IQ. Thus, after summing the mental age as obtained at each level, the final mental age is divided by the chronological age and multiplied by 100.

**Vineland Adaptive Behavior Scales**

The Vineland Adaptive Behavior Scales was developed by Sara Sparrow, David Balla, and Domenic Cicchetti in 1984, as a revision of the Vineland Social Maturity Scale (Doll, 1935; 1965). The revised Vineland has three versions: the Interview Edition, Survey Form; the Interview Edition, Expanded Form; and the Classroom Edition. For the purposes of this study only the Interview Edition, Survey Form, will be used.

The Vineland is designed to measure the personal and social sufficiency of individuals from birth to adulthood. Adaptive behavior as defined by the test authors is "age
related," "defined by the expectations or standards of other people" and defined by "typical performance, not ability."
Although the scales do not require direct administration of items to an individual, it does require a respondent who is familiar with the individual to answer questions regarding the behavior of the individual. The scores have direct application to handicapped, as well as nonhandicapped individuals.

The Survey Form was normed on a representative national standardization sample of approximately 4800 handicapped and nonhandicapped individuals. It contains 297 items distributed along four domains: Communication, Daily Living Skills, Socialization, and Motor Skills. The Adaptive Behavior Composite is the overall score based on the individual's reported performance in the four domains. For each of the four adaptive behavior domains and the Adaptive Behavior Composite, standard scores (mean = 100; standard deviation = 15), percentile ranks, stanines, adaptive levels, and age equivalents are provided.

In addition, for certain age levels and handicapping conditions supplementary norm group percentile ranks are provided for the four domains and Adaptive Behavior Composite. Finally, there is an optional Maladaptive Behavior domain which indicates whether an individual exhibits a significant number of aberrant behaviors in relation to one of the norm groups.
The test manual provides extensive data regarding
reliability and validity of the Vineland. The split half
reliability coefficients for the Survey Form Adaptive
Behavior Composite range from .89 to .98. Test-retest
reliability coefficients range from .77 to .99. In terms of
validity coefficients (criterion-related) there are
correlations of .32 reported between the Adaptive Behavior
Composite (ABC) and the Mental Processing Composite of the
Kaufman Assessment Battery for Children, and .28 between the
ABC and the Peabody Picture Vocabulary Test - Revised. For
ambulatory and nonambulatory mentally retarded adults, there
is a correlation of .33 reported with the ABC and Stanford-
Binet IQ (N = 165).

**Description of Research Participants**

Individuals involved in the current study include
direct care providers, profoundly handicapped residents, and
psychologists. Direct care providers, also known in the
literature as, resident training instructors, psychology
technicians, and mental health workers, are the primary
research participants. It is these individuals who provide
almost all direct client care (i.e., feeding, changing,
dressing, programming, and stimulation) in intermediate care
facilities for the mentally retarded. In terms of education,
the individuals invited to be participants have at least a
high school diploma or equivalent, some have junior college
degrees or coursework, and a few had earned a baccalaureate
degree. Of those staff involved in client care and training,
these staff members have traditionally been the lowest paid. In terms of job experience, the criteria set for participation in the study was 3 months of experience at the present facility and 1 month with the particular client being rated.

Residents selected for participation in the study were all served under the classification of profoundly mentally handicapped. The age range of the residents was from 14 to 69 years of age. Length of institutionalization ranged from 4 to 25 years.

The primary researcher in the study, has 13 years of experience as a school psychologist, is certified and licensed by the State of Florida, and is nationally certified by the National Association of School Psychologists. He has worked in various roles with mentally handicapped persons for the past 13 years.

Description of Participant Training

Direct care providers at each facility met in groups with the primary researcher to discuss and overview the study. Their role in the study was thoroughly explained. Issues in regard to high turnover rates, low pay, lack of a standardized data base and the lack of direct care provider participation in habilitation plan meetings with equal standing in terms of a data base was discussed and related to quality of resident care. These meetings required 30 to 60 minutes depending upon group size and questions asked.
Each direct care provider (hereafter also referred to as "rater") was provided with a sufficient number of BAMHRs for each resident in the facility to be evaluated and two extra copies in case of error or loss. They were instructed to read the one page of instructions. The development of the BAMHR and their responsibilities for completing the BAMHR appropriately, were discussed. Questions were answered. Several of the BAMHR dimensions were reviewed as examples.

At the end of the session the raters were instructed to complete the BAMHR for each of the residents with whom they were working. They were instructed to complete each resident's scale the same day it was started. Furthermore, they were instructed not to discuss their ratings with other raters and to evaluate each resident independently of the other raters. Although it was felt that each BAMHR could be completed in about 20 minutes, due to the many pressing duties of each rater, the primary researcher asked to return in one week to collect the rating scales. In fact, the length of time required for each facility to complete the ratings ranged from 30 to 120 days. Several facilities needed multiple inservices due to the high turnover rate and direct care rater study participation requirements. Thus, other than familiarizing the raters with the particulars and need for the study, as well as answering their questions in regard to the rating scale, no direct training of the raters occurred.
**Preliminary Study**

A preliminary study using the BAMHR was conducted using 10 nonambulatory residents considered to be profoundly mentally handicapped in an ICF/MR facility in North Florida. They ranged in age from 8 to 38 years ($M = 21.8$ years) with mental ages ranging from 1.6 months to 19.1 months ($M = 4.0$ months). These residents were randomly selected from among the 24 clients residing at the facility. Ten direct care providers were selected as raters who were judged by their supervisors to be the most reliable in regards to knowledge of resident functioning.

Raters were given no training on the BAMHR with the exception of reading the standard directions and the purpose. Procedural questions were addressed in a noncommittal manner. Raters were randomly assigned to residents, whereby after the first five residents were selected and assigned, the second five residents were selected and assigned. Thus, even though there were 10 residents and 10 raters, five raters rated five residents and a different group of five raters rated the other five residents. Raters were specifically instructed not to share their ratings among one another.

Raters were able to attain a high degree of percentage of agreement (79.15) among each other across all clients and dimensions. Further, they concurred with each other's ratings of each resident at the 100 percent level more often than at any other level. Thus, the raters seemed to view each resident quite similarly.
The scale point values of 1 to 5 provided the raters with an adequate range within which to assess each behavior or dimension evaluated. Further, at each scale point value there were numerous instances in which perfect agreement or perfect agreement within one was obtained. Fifty-six percent (9) of all dimensions (16) received perfect agreement or perfect agreement within one across all raters and residents.

The dimensions judged easiest to rate based on highest percentage agreement were: Oral Motor Vocalization (95%), Mobility (94%), and Tonicity (92.5%). The dimensions judged most difficult to rate based on the lowest percentage of agreement were: Visual Acuity (61%), Consequence Preference (61%), Memory (71%), and Compliance (72%). Thus, untrained direct care providers identified the same areas that have been most baffling to professionals in assessment who have worked with the profoundly handicapped population for years.

Recommendations from the initial study included the incorporation of structured direct care assessment data into the multidisciplinary process and thus, making the direct care providers a more integral part of "team." The BAMHR could be used to indicate priority areas in need of programming or training or it could pinpoint initial concern areas of the direct care provider for residents new to the institution. Those dimensions receiving the lowest percentage of agreement were then rewritten to insure the highest level of clarity at each scale point value. However, it was felt that a dimension should not be omitted simply
because it failed to achieve a high level of agreement. The confusion may be more a function of client behavior, than a lack of clarity within the BAMHR.

**Statistical Analyses**

**Design**

The data for the BAMHR instrument was collected according to the design depicted in Figure 1. Raters from each facility who met criteria for study participation used the BAMHR instrument to rate all clients within the facility with whom they worked. The number of raters and clients per facility varied. To reduce situational variance, all raters within a facility rated the same client as concurrently as possible.

**Interrater Reliability**

Using the Raters X Clients repeated measures design depicted in Figure 2, interrater reliabilities were assessed for the BAMHR by computing the Intraclass Correlations to analyze Between Rater versus Within Rater variance. Intraclass Correlations were computed separately by facility. Since the interrater reliability coefficients obtained were sufficiently large (.80 or more), subsequent analyses used composite data averaged across raters.

**Concurrent Validity**

Provided there is sufficient interrater reliability (.80 or greater), a BAMHR Client Average Score was computed for each client by averaging BAMHR Total Scores across all raters for that client. Then, using the data layout depicted in
Note: \( r_n \) = Number of Raters in Facility \( n \)
\( c_n \) = Number of Clients in Facility \( n \)
\( f \) = Number of Facilities

Figure 1. Design for BAMHR Instrument Data Collection.
**INTERRATER RELIABILITY**

The data layout above depicts a Raters X Clients repeated measures design for computing Intraclass Correlations, by Facility, to analyze the Between Rater variance relative to the Within Rater variance. The dependent measure will be the BAMHR Total Score.

*Figure 2. Data Layout for BAMHR Interrater Reliability.*
Figure 3, concurrent (convergent) validity was assessed by computing Pearson Product Moment Correlation Coefficients by facility among the BAMHR Client Average and the criterion measures: the Bayley Motor Score (months), the Bayley Mental Score (months), the Cattell Infant Intelligence Scale, and the Vineland Adaptive Behavior Scale (Adaptive Behavior Composite). The four criterion measures were obtained, for each client, from historical records kept in each facility. Additionally, data for all clients from all facilities were pooled for a composite analysis.

Internal Reliability

Since there was sufficient interrater reliability, BAMHR Client Item Averages were computed for each client by obtaining an average score for each BAMHR item, calculated across all raters for that client. Then, using the data layout depicted in Figure 4, internal reliability was assessed by computing Cronbach's alpha on the Client Item Averages by facility. Additionally, data from all clients from all facilities were pooled for a composite analysis.

Multiple Regressions

As an extension of the Concurrent Validity analysis mentioned above, the BAMHR Client Average Score (the BAMHR Total Score per client, averaged across all raters for the client) was used in multiple regression analyses predicting the BAMHR Client Average Score from the Bayley Mental and Motor Scores, the Cattell Infant Intelligence Scale Score, and the Vineland Adaptive Behavior Composite Score. Separate
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<th>FACILITY</th>
<th>CLIENT</th>
<th>BAMHR AVERAGE</th>
<th>BAYLEY Mn &amp; Mt</th>
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*BAMHR CLIENT AVERAGE:
This is the BAMHR Total Score averaged across raters within a facility. Thus, Facility 1, Client 1's BAMHR Client Average is the average of the BAMHR Total Scores of all r₁ Raters in Facility 1 when rating Client 1.

CONCURRENT VALIDITY
Assessed by computing the matrix of Pearson Correlations among the BAMHR Client Average, Bayley Mental, Bayley Motor, and Cattell Infant Intelligence Scales.

Figure 3. Data Layout for Concurrent Validity.
**CLIENT ITEM AVERAGE**

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**FACILITY f**

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*CLIENT ITEM AVERAGES:*

These are the averages for each BAMHR item computed across raters within facilities. Thus, the Client Item Average of Facility 1, Client 1, Item 1 is the average of all $r_1$ Raters in Facility 1 when rating Client 1 on Item 1.

**INTERNAL RELIABILITY**

Assessed by computing Cronbach’s alpha on the Client Item Average Scores. All Clients will be pooled together in computing Cronbach’s alpha.

*Figure 4.* Data Layout for BAMHR Internal Reliability.
analyses were performed, by facility, using each of the above predictors in pairs as well as in tandem. In addition, clients from all facilities were pooled for composite multiple regression analyses.

**Factor Analysis**

Using the data layout depicted in Figure 4, a factor analysis of the BAMHR Client Item Averages was conducted using the principal factor solution; with squared multiple correlations as the prior communality estimates; this is the standard starting point for factor analysis. The number of principal factors yielding eigenvalues (an index of the importance, or explained variance of each factor) of 1.00 or better were rotated, using the standard orthogonal varimax method, to attain simple structure. In any case, if an acceptable factor solution is found, factor scores were computed for each client on the rotated dimensions. These factor scores were correlated (using Pearson Product Moment Correlation) with the Bayley Mental Score (month), the Cattell Infant Intelligence Scale, and the Vineland Adaptive Behavior Scale (ABC), for each client. The results of this analysis provided information on differential (i.e., dimension-dependent) concurrent validity.

**Limitations of the Study**

**Internal Validity**

Internal validity refers to the efficacy with which extraneous variables are controlled in a study (McMillan & Schumacher, 1984). The most serious threat to internal
validity is usually lack of random selection of subjects. In this study, all residents from whom permission was obtained participated in this study. All raters who met criteria also participated. Thus, there was no systematic bias in either client or rater participation.

Maturation, while possibly an issue, will in all probability not be a factor due to the generally recognized and accepted, slow rate of development of profoundly handicapped persons.

**External Validity**

External validity refers to the generalizability or representativeness of the findings, i.e., the populations and settings to which the findings be generalized (Ary, Jacobs, & Razavieh, 1979). Population external validity is limited to institutionalized, nonambulatory profoundly mentally handicapped residents in northeast and north central Florida. Ecological validity is limited to similarly handicapped residents living in ICF/MR facilities in the region.
CHAPTER 4
RESULTS

This chapter presents the results of the analyses conducted to answer the research questions. The analyses were based on data from six facilities for individuals with profound mental handicaps, using 139 direct care workers completing a total of 845 BAMHR instruments on 169 residents.

Although it was expected that Bayley Motor scores would be readily available, this was not the case. Only 19 Bayley Motor scores were collected. Thus, major analyses using the Bayley Motor scores were omitted except in specific instances.

Due to some missing data (less than one percent), the BAMHR Adjusted Total score (previously referred to as BAMHR Client Average) was used. The BAMHR Adjusted Total is the average for each BAMHR item computed across Raters X 16 (the sixteen dimensions of the BAMHR). This puts the score on the same scale as a normal total score without missing data.

The reliability of the BAMHR will be established prior to presenting descriptive validity, multiple regression, and factor analytic data. Finally, a data summary will be provided.
Interrater Reliability

Interrater reliability is the degree to which raters, rating the same subject, agree on their ratings. The direct care providers (raters) in each facility completed the 16-item BAMHR on the residents with whom they worked. Interrater reliabilities within each facility were computed by calculating Intraclass Correlations on the BAMHR Adjusted Totals (see Figure 2).

The interrater reliabilities for each facility are presented in Table 1. The Intraclass Correlations range from a low of .8164 (Facility 4) to .9535 (Facility 6). Since .80 is often regarded as an acceptable level of interrater reliability, all facilities exceeded that level, and thus, the BAMHR demonstrates a sufficient level of interrater reliability with these samples.

It should be noted that Facility 4, which had the fewest number of raters and fewest number of total ratings, was also the least reliable; a finding common in reliability analyses. Facility 6 contained the largest number of raters and total ratings and provided the most reliable data. Facility 5, while providing the second highest total of raters and number of ratings was undergoing a facility-wide state survey at the time of this study. The added stress that those surveys entail, may at least partially explain, the "relatively" low reliability in comparison to other facilities with similar numbers of ratings.
Table 1
BAMHR Interrater Reliabilities By Facility (Intraclass Correlations)

<table>
<thead>
<tr>
<th>Facility</th>
<th>Number of Residents</th>
<th>Number of Raters</th>
<th>Total Number of Ratings</th>
<th>Intraclass Correlations</th>
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<tbody>
<tr>
<td>1</td>
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<td>16</td>
<td>128</td>
<td>.9003</td>
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<td>2</td>
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<tr>
<td>3</td>
<td>22</td>
<td>27</td>
<td>150</td>
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<td>4</td>
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<td>9</td>
<td>63</td>
<td>.8164</td>
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<td>5</td>
<td>41</td>
<td>31</td>
<td>157</td>
<td>.8344</td>
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<td>34</td>
<td>32</td>
<td>191</td>
<td>.9535</td>
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</table>

Internal Reliability

Internal reliability is a measure of the homogeneity or consistency of the 16-item BAMHR instrument, or the covariance of the items relative to the total score. Table 2 presents Cronbach's Coefficient Alpha internal reliabilities by facility. Internal reliability coefficients range from a low of .9284 to .9694. These values indicate that the BAMHR is an internally reliable instrument.

Table 2
BAMHR Internal Reliabilities By Facility (Cronbach's Alpha)

<table>
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<th>Facility</th>
<th>Raw Form</th>
<th>Standardized Form</th>
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<td>6</td>
<td>.9684</td>
<td>.9694</td>
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</table>
Descriptive Data Analysis

Table 3 depicts the descriptive statistics for each facility and, finally, pooled across all facilities. The BAMHR Adjusted Total across raters represents the cumulative BAMHR score summed across the 16 dimensions on the 1 to 5 scale adjusted for missing data. A score of 80 is the maximum obtainable on the BAMHR. Theoretically, and in the development of the scale, a score of 80 was thought to represent a 12-month level. Bayley Mental scores, Vineland Adaptive Behavior Composite (ABC), and Cattell scores are in month levels. Age of the residents is shown in years.

In Facility 1, Bayley (mental), Vineland (ABC), and Cattell scores were approximately in the 9-1/2 month to 11 month range. The BAMHR adjusted total score of 51.89 represents 65 percent of the maximum of 80 total points and falls in the 7-8 month range.

In Facility 2, Bayley and Cattell scores fell in the 4-1/2 to 5 month range with the Vineland noted at almost 13 months. The BAMHR score of 42.63 represents 53% of the maximum of 80 and falls in the 6.4 month range, commensurate with Bayley and Cattell scores.

Bayley, Cattell, and Vineland scores in Facility 3 ranged from 3.2 to 5.4 months. The BAMHR score of 42.99 represents approximately a 6.4 month level.

Facility 4, which contained the least number of residents, had the greatest variability among the four measures. The Bayley was noted at 11.14 months, the Cattell
Table 3  
**Descriptive Statistics By Facility (All Data)**

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<td>51.89</td>
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<td>9.43</td>
<td>7.61</td>
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<tr>
<td>Vineland ABC (months)</td>
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<td>10.91</td>
<td>7.76</td>
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<td>Cattell (months)</td>
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<td>Age (years)</td>
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<td>33.00</td>
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<td>Vineland ABC (months)</td>
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<td>Vineland ABC (months)</td>
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<td></td>
</tr>
<tr>
<td>BAMHR (Adj. Total) Across Raters</td>
<td>41</td>
<td>49.02</td>
<td>11.76</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7.35)*</td>
<td></td>
</tr>
<tr>
<td>Bayley Mental (months)</td>
<td>44</td>
<td>9.25</td>
<td>4.19</td>
</tr>
<tr>
<td>Vineland ABC (months)</td>
<td>43</td>
<td>9.44</td>
<td>3.61</td>
</tr>
<tr>
<td>Cattell (months)</td>
<td>44</td>
<td>9.66</td>
<td>4.01</td>
</tr>
<tr>
<td>Age (years)</td>
<td>44</td>
<td>33.89</td>
<td>9.53</td>
</tr>
<tr>
<td><strong>Facility 6</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAMHR (Adj. Total) Across Raters</td>
<td>35</td>
<td>42.90</td>
<td>16.47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(6.43)*</td>
<td></td>
</tr>
<tr>
<td>Bayley Mental (months)</td>
<td>31</td>
<td>9.64</td>
<td>8.11</td>
</tr>
<tr>
<td>Vineland ABC (months)</td>
<td>32</td>
<td>10.38</td>
<td>7.32</td>
</tr>
<tr>
<td>Cattell (months)</td>
<td>31</td>
<td>9.66</td>
<td>8.50</td>
</tr>
<tr>
<td>Age (years)</td>
<td>31</td>
<td>40.32</td>
<td>12.57</td>
</tr>
<tr>
<td><strong>All Facilities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAMHR (Adj. Total) Across Raters</td>
<td>170</td>
<td>47.09</td>
<td>14.42</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7.06)*</td>
<td></td>
</tr>
<tr>
<td>Bayley Mental (months)</td>
<td>145</td>
<td>8.21</td>
<td>6.46</td>
</tr>
<tr>
<td>Vineland ABC (months)</td>
<td>145</td>
<td>10.05</td>
<td>7.45</td>
</tr>
<tr>
<td>Cattell (months)</td>
<td>140</td>
<td>8.14</td>
<td>6.17</td>
</tr>
<tr>
<td>Age (years)</td>
<td>148</td>
<td>33.86</td>
<td>11.39</td>
</tr>
<tr>
<td>Bayley Motor (months)</td>
<td>19</td>
<td>6.62</td>
<td>3.23</td>
</tr>
</tbody>
</table>

*Represents the theoretical month level of the BAMHR; based on 80 possible points representing a 12-month level.

at 7.3 months, and the Vineland at 13.4 months. The BAMHR score of 53.43, represents approximately an 8 month level, consistent with other scores.

Facility 5, which contained the greatest number of residents, had the least variability among the three
standardized measures - 9.25 to 9.66 months. The BAMHR total of 49.02 represents approximately a 7.4 month level.

Bayley, Vineland, and Cattell scores in Facility 6 ranged from 9.6 to 10.4 months. This facility contained the second highest number of residents. The BAMHR total score of 42.90, represents approximately a 6.4 month level.

Across facilities, the mean age of the residents ranged from 24.81 years to 40.32 years with a grand mean of 33.86 years. Bayley Mental scores ranged from a mean low score of 3.18 months, to a mean high score of 11.14 months. The grand mean was 8.21 months. Vineland scores ranged from a mean low score of 5.42 months, to a mean high score of 13.43 months. The grand mean was 10.05 months. Cattell scores ranged from a mean low score of 3.29 months, to a mean high score of 10.00 months. The grand mean was 8.14 months. BAMHR scores ranged from a mean low score of 42.63 to a mean high score of 53.79. The grand mean was 47.09. This was indicative of a mean range of 6.39 months to 8.07 months with a grand mean of 7.06 months.

These data indicate that the population of residents who are profoundly mentally handicapped in this study was similar in terms of overall functioning level and all scored within the range designated profoundly mentally handicapped. With the exception of Facility 4, which contained the youngest and fewest residents, most residents were in the 30 to 40 year range.
Basic Correlations Among Research Instruments

Basic correlations among the four research instruments are shown in Table 4. In Facility 1, all correlations between each of the four research instruments were significant and positive at the .0001 probability level or better. Of primary interest, the BAMHR Adjusted Total score correlated significantly with the three standardized and traditional cognitive and developmental measures: Bayley Mental, Vineland (ABC), and Cattell, at the .0001 level or better.

Facility 2 also yielded significant correlations among all four research instruments. The BAMHR Adjusted Total scores yielded significant correlations between each of the three traditional measures, at the .0004 level or better.

In Facility 3, the BAMHR Adjusted Total correlated significantly with the three traditional measures: Bayley Mental, Vineland (ABC), and Cattell, at the .0003 level or better. Facility 3 also included data from the Bayley Scales Motor section. The Motor Scale correlated negatively, but nonsignificantly with the Vineland (ABC) and did not correlate significantly with the BAMHR Adjusted Total.

The correlations in Facility 4 were based on the fewest number of residents. Significant correlations were obtained between the BAMHR Adjusted Total and Bayley Mental and Vineland (ABC). The Bayley Mental correlated significantly with the Vineland (ABC) and Cattell. Marginal correlations were obtained between the BAMHR Adjusted Total and Bayley
### Table 4
#### Basic Correlations By Facility

<table>
<thead>
<tr>
<th>Facility 1</th>
<th>2 Bayley Mental (months)</th>
<th>3 Vineland (ABC) (months)</th>
<th>4 Cattell (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BAMHR Adjusted Total</td>
<td>$r = 0.6674$</td>
<td>$p = 0.0007$</td>
<td>$n = 22$</td>
</tr>
<tr>
<td>2. Bayley Mental (months)</td>
<td>$r = 0.7354$</td>
<td>$p = 0.0001$</td>
<td>$n = 22$</td>
</tr>
<tr>
<td>3. Vineland (ABC) (months)</td>
<td>$r = 0.7293$</td>
<td>$p = 0.0002$</td>
<td>$n = 21$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Facility 2</th>
<th>2 Bayley Mental (months)</th>
<th>3 Vineland (ABC) (months)</th>
<th>4 Cattell (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BAMHR Adjusted Total</td>
<td>$r = 0.8016$</td>
<td>$p = 0.0001$</td>
<td>$n = 20$</td>
</tr>
<tr>
<td>2. Bayley Mental (months)</td>
<td>$r = 0.7172$</td>
<td>$p = 0.0004$</td>
<td>$n = 20$</td>
</tr>
<tr>
<td>3. Vineland (ABC) (months)</td>
<td>$r = 0.5883$</td>
<td>$p = 0.0102$</td>
<td>$n = 18$</td>
</tr>
</tbody>
</table>
Table 4--continued

### Facility 3

<table>
<thead>
<tr>
<th></th>
<th>2 Bayley Mental (months)</th>
<th>3 Bayley Motor (months)</th>
<th>4 Vineland (ABC) (months)</th>
<th>5 Cattell (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.BAMHR Adjusted Total</td>
<td>$r = .7999$</td>
<td>$p = .0001$</td>
<td>$n = 17$</td>
<td>$r = .4903$</td>
</tr>
<tr>
<td>2.Bayley Mental (months)</td>
<td>$r = .7431$</td>
<td>$p = .0008$</td>
<td>$n = 11$</td>
<td>$r = .5878$</td>
</tr>
<tr>
<td>3.Bayley Motor (months)</td>
<td>$r = -.1041$</td>
<td>$p = .7898$</td>
<td>$n = 9$</td>
<td>$r = .6058$</td>
</tr>
<tr>
<td>4.Vineland (ABC) (months)</td>
<td>$r = .7642$</td>
<td>$p = .0009$</td>
<td>$n = 15$</td>
<td></td>
</tr>
</tbody>
</table>

### Facility 4

<table>
<thead>
<tr>
<th></th>
<th>2 Bayley Mental (months)</th>
<th>3 Bayley Motor (months)</th>
<th>4 Vineland (ABC) (months)</th>
<th>5 Cattell (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.BAMHR Adjusted Total</td>
<td>$r = .6069$</td>
<td>$p = .0477$</td>
<td>$n = 11$</td>
<td>$r = .6726$</td>
</tr>
<tr>
<td>2.Bayley Mental (months)</td>
<td>$r = .7409$</td>
<td>$p = .0568$</td>
<td>$n = 7$</td>
<td>$r = .9368$</td>
</tr>
<tr>
<td>3.Bayley Motor (months)</td>
<td>$r = .8749$</td>
<td>$p = .1251$</td>
<td>$n = 4$</td>
<td>$r = .5371$</td>
</tr>
<tr>
<td>4.Vineland (ABC) (months)</td>
<td>$r = .7409$</td>
<td>$p = .0920$</td>
<td>$n = 6$</td>
<td></td>
</tr>
</tbody>
</table>
Table 4--continued

### Facility 5

<table>
<thead>
<tr>
<th>1. BAMHR Adjusted Total</th>
<th>2 Bayley Mental (months)</th>
<th>3 Vineland (ABC) (months)</th>
<th>4 Cattell (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$r = 0.6288$</td>
<td>$0.7682$</td>
<td>$0.4837$</td>
</tr>
<tr>
<td></td>
<td>$p = 0.0001$</td>
<td>$0.0001$</td>
<td>$0.0014$</td>
</tr>
<tr>
<td></td>
<td>$n = 41$</td>
<td>$40$</td>
<td>$41$</td>
</tr>
</tbody>
</table>

| 2. Bayley Mental (months) | $r = 0.4679$            | $0.8856$                  |
|                          | $p = 0.0016$            | $0.0001$                  |
|                          | $n = 43$                | $44$                      |

| 3. Vineland (ABC) (months) | $r = 0.4121$            |
|                           | $p = 0.0060$            |
|                           | $n = 43$                |

### Facility 6

<table>
<thead>
<tr>
<th>1. BAMHR Adjusted Total</th>
<th>2 Bayley Mental (months)</th>
<th>3 Vineland (ABC) (months)</th>
<th>4 Cattell (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$r = 0.8575$</td>
<td>$0.8903$</td>
<td>$0.8164$</td>
</tr>
<tr>
<td></td>
<td>$p = 0.0001$</td>
<td>$0.0001$</td>
<td>$0.0001$</td>
</tr>
<tr>
<td></td>
<td>$n = 31$</td>
<td>$32$</td>
<td>$31$</td>
</tr>
</tbody>
</table>

| 2. Bayley Mental (months) | $r = 0.8593$            | $9.585$                   |
|                          | $p = 0.0001$            | $0.0001$                  |
|                          | $n = 31$                | $31$                      |

<p>| 3. Vineland (ABC) (months) | $r = 0.8499$            |
|                           | $p = 0.0001$            |
|                           | $n = 32$                |</p>
<table>
<thead>
<tr>
<th></th>
<th>2 Bayley Mental (months)</th>
<th>3 Bayley Motor (months)</th>
<th>4 Vineland (ABC) (months)</th>
<th>5 Cattell (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BAMHR Adjusted Total</td>
<td>r = 0.7066</td>
<td>r = 0.6362</td>
<td>r = 0.7056</td>
<td>r = 0.6546</td>
</tr>
<tr>
<td></td>
<td>p = 0.0001</td>
<td>p = 0.0034</td>
<td>p = 0.0001</td>
<td>p = 0.0001</td>
</tr>
<tr>
<td></td>
<td>n = 142</td>
<td>n = 19</td>
<td>n = 142</td>
<td>n = 137</td>
</tr>
<tr>
<td>2. Bayley Mental (months)</td>
<td>r = 0.5229</td>
<td>r = 0.7579</td>
<td>r = 0.9581</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p = 0.0216</td>
<td>p = 0.0001</td>
<td>p = 0.0001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n = 19</td>
<td>n = 138</td>
<td>n = 140</td>
<td></td>
</tr>
<tr>
<td>3. Bayley Motor (months)</td>
<td>r = 0.3267</td>
<td>r = 0.6612</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>p = 0.2542</td>
<td>p = 0.0021</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n = 14</td>
<td>n = 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Vineland (ABC) (months)</td>
<td>r = 0.7366</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>p = 0.0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n = 134</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Motor, Bayley Mental and Bayley Motor, and Vineland (ABC) and Cattell Infant Intelligence Scale. Nonsignificant correlations were obtained between the BAMHR Adjusted Total and Cattell and Bayley Motor with the Vineland (ABC) and Cattell.

In Facility 5, significant correlations were again obtained between the BAMHR and the three traditional measures at the .0001 level or better. As in the other facilities, correlations between Bayley Mental and Cattell were among the highest.

Correlations among the four research instruments were significant at the .0001 level in Facility 6. The BAMHR Adjusted Total score correlated with the three traditional
measures at the .0001 level. Similar significance levels were attained for all other correlations.

Across all facilities, the BAMHR Adjusted Total score correlated significantly with the Bayley Mental at the .0001 level, Bayley Motor at the .0034 level, Vineland (ABC) at the .0001 level, and Cattell at the .0001 level. Correlations among all measures, with the exception of the Bayley Motor (due to the low number of obtained scales), were noted at the .0001 level.

**Multiple Regression Analysis**

Table 5 depicts descriptive statistics based upon the sub-sample of residents who were used in the multiple regression predicting the BAMHR from the Bayley, Cattell, and Vineland; that is, who had scores on all four of these measures. In Facility 1, residents achieved mean month levels ranging from a low score of 7.56 months on the BAMHR, to a high score of 10.67 months on the Vineland. In Facility 2, residents achieved mean month levels ranging from a low score of 4.62 months on the Cattell to a high score of 8.94 months on the Vineland. In Facility 3, residents achieved mean month levels ranging from a low score of 3.13 months on the Bayley, to a high score of 5.88 months on the BAMHR. In Facility 4, residents achieved mean month levels ranging from a low score of 6.68 months on the Bayley to a high score of 10.33 months on the Vineland. In Facility 5, residents achieved a low score of 7.44 months on the BAMHR, to a high score of 9.65 months on the Vineland. In Facility 6,
<table>
<thead>
<tr>
<th>Variables</th>
<th>Facility 1</th>
<th>Facility 2</th>
<th>Facility 3</th>
<th>Facility 4</th>
<th>Facility 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAMHR (Adj. Total)</td>
<td>21</td>
<td>18</td>
<td>15</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>Mean</td>
<td>50.54</td>
<td>38.68</td>
<td>39.47</td>
<td>52.96</td>
<td>49.30</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>13.26</td>
<td>10.51</td>
<td>10.41</td>
<td>5.91</td>
<td>11.78</td>
</tr>
<tr>
<td>Bayley Mental (months)</td>
<td>21</td>
<td>18</td>
<td>15</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>Mean</td>
<td>9.31</td>
<td>4.65</td>
<td>3.13</td>
<td>6.68</td>
<td>9.14</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>7.78</td>
<td>3.19</td>
<td>1.74</td>
<td>2.05</td>
<td>3.95</td>
</tr>
<tr>
<td>Vineland ABC (months)</td>
<td>21</td>
<td>18</td>
<td>15</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>Mean</td>
<td>10.67</td>
<td>8.94</td>
<td>3.53</td>
<td>10.33</td>
<td>9.65</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>7.87</td>
<td>3.80</td>
<td>2.59</td>
<td>5.42</td>
<td>3.54</td>
</tr>
<tr>
<td>Cattell (months)</td>
<td>21</td>
<td>13</td>
<td>15</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>Mean</td>
<td>10.00</td>
<td>4.62</td>
<td>3.73</td>
<td>7.50</td>
<td>9.34</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>8.05</td>
<td>2.91</td>
<td>1.77</td>
<td>3.33</td>
<td>3.84</td>
</tr>
</tbody>
</table>
Table 5--continued

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facility 6</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAMHR (Adj. Total)</td>
<td>31</td>
<td>42.91</td>
<td>16.79</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(6.48)*</td>
<td></td>
</tr>
<tr>
<td>Bayley Mental (months)</td>
<td>31</td>
<td>9.64</td>
<td>8.11</td>
</tr>
<tr>
<td>Vineland ABC (months)</td>
<td>31</td>
<td>10.32</td>
<td>7.44</td>
</tr>
<tr>
<td>Cattell (months)</td>
<td>31</td>
<td>9.66</td>
<td>8.50</td>
</tr>
</tbody>
</table>

| **All Facilities**         |     |         |                    |
| BAMHR (Adj. Total)         | 131 | 45.57   | 13.58              |
|                            |     | (6.84)* |                    |
| Bayley Mental (months)     | 131 | 7.87    | 6.05               |
| Vineland ABC (months)      | 131 | 9.21    | 5.85               |
| Cattell (months)           | 131 | 8.08    | 6.25               |

*Represents the theoretical month level of the BAMHR; based on 80 possible points representing at least a 12-month level.

Residents achieved mean month levels ranging from a low score of 6.48 months on the BAMHR, to a high score of 10.32 months on the Vineland. Across all facilities, residents achieved mean month levels ranging from a low score of 6.84 months on the BAMHR, to a high score of 9.21 month levels on the Vineland.

Interestingly, the Vineland produced the highest mean scores in five of the six facilities, as well as across all facilities. The BAMHR produced the lowest scores in three of the six facilities, as well as across all facilities. However, the greatest difference in scores among the four research instruments was only 4.32 months noted in Facility
2. This is a negligible difference considering the mean population age of 33 years.

The BAMHR was used as a criterion variable in several multiple regression analyses using Bayley (Mental), Vineland (ABC), and Cattell indices as predictors in pairs and taken together. The Bayley Motor Scales were not used in these analyses since only 19 total motor scales were collected. These analyses provide an indication of which combination of predictors are most effective in accounting for BAMHR variance. Results of these multiple regressions for the predictors for each facility and across all facilities are displayed in Table 6.

In Facility 1, all combinations of predictors were significant at the .0046 level or better. The Vineland (ABC), when combined with the Bayley Mental (.0001) and Cattell (.0002), were highly significant predictors of the BAMHR.

In Facilities 2 and 3, all predictors in combination and together were significant at the .0009 level or better. The Vineland (ABC), when paired with the Bayley Mental and Cattell yielded highly significant correlations at the .0001 level.

Facility 4 was comprised of the fewest numbers of residents and raters. This is probably the factor most responsible for the weakest predictions. Nevertheless, the Vineland (ABC) paired with the Bayley Mental were significant predictors at the .0033 level. The Vineland (ABC) and Cattell were significant predictors at the .0354 level.
Table 6
Multiple Regression Using BAMHR as Criterion Variable

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Facility 1</th>
<th></th>
<th>Facility 2</th>
<th></th>
<th>Facility 3</th>
<th></th>
<th>Facility 4</th>
<th></th>
<th>Facility 5</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>$R^2$</td>
<td></td>
<td>P</td>
<td></td>
<td>P</td>
<td></td>
<td>P</td>
<td></td>
<td>P</td>
</tr>
<tr>
<td>Bayley Mental$^1$ &amp; Vineland ABC$^2$</td>
<td>22</td>
<td>.6184</td>
<td></td>
<td>.0001</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bayley Mental &amp; Cattell</td>
<td>21</td>
<td>.4504</td>
<td></td>
<td>.0046</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vineland &amp; Cattell</td>
<td>21</td>
<td>.6080</td>
<td></td>
<td>.0002</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All$^3$</td>
<td>21</td>
<td>.6173</td>
<td></td>
<td>.0008</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bayley Mental$^1$ &amp; Vineland ABC$^2$</td>
<td>20</td>
<td>.7033</td>
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<td>131</td>
<td>.5972</td>
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<tr>
<td>All³</td>
<td>131</td>
<td>.6195</td>
<td>.0001</td>
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</table>

Note: ¹Bayley (mental) = the mental portion of the Bayley Scales using mental ages represented in months
²Vineland (ABC) = Vineland Adaptive Behavior Composite in months
³All = Bayley (Mental), Cattell, & Vineland (ABC)

The Bayley and Cattell, and all measures taken together, were not significant sets of predictors.

Facilities 5 and 6 were comprised of the most residents. All measures (Bayley, Vineland, Cattell) when paired, and taken together were significant predictors at the .0001 level.

In all but one facility, the Bayley and the Vineland proved to be the best combination of predictors in accounting for variance in the BAMHR. The second best pair, in terms of predicting BAMHR variance, was the Cattell and Vineland.
The same pattern can be observed when using analyses from all facilities. The Bayley (Mental), Vineland (ABC), and Cattell, when used in pairs and with all three combined, were significant predictors at the .0001 level.

Appendix C displays the beta weights (standardized multiple regression coefficients) and their associated probabilities, that accompany the multiple regression analyses summarized in Table 6, by facility. These beta weights reinforce the above findings that the Bayley and Vineland measures tended to be the best predictors of the BAMHR, followed by the Cattell. In Facilities 1, 4, 5, and 6, the Vineland proved to be the stronger predictor when used in combination with the Bayley; in Facilities 2 and 3, the reverse was true.

Appendix D displays the beta weights and their associated probabilities, obtained by predicting the BAMHR from the Bayley, Vineland, and Cattell measures simultaneously; these beta weights accompany the multiple regression analyses displayed in Table 6, by facility. In all facilities, the Vineland proved to be the strongest predictor of the BAMHR, generally followed by the Bayley (with the exception of Facility 4), and finally, the Cattell.

Factor Analysis

The underlying factor structure of the BAMHR was analyzed through Principal Factor Analysis. The initial unrotated factor solution yielded two factors with eigenvalues greater than 1, specifically, 9.7204 and 1.6314.
The eigenvalue is an index of the amount of variance explained by the unrotated factors. The first factor accounts for approximately six times more variance than the second factor. Thus, it seems that the majority of the instrument is unidimensional, although there is a second but weak factor.

Table 7 presents the results of the rotated Principal Factor Analysis using the varimax method. The following item numbers (and names) loaded predominantly on Factor 1:

3 (Vision)
4 (Hearing)
9 (Motor Imitation)
10 (Vocalizations)
11 (Verbal Imitation)
12 (Reinforcers)
13 (Social Responsiveness)
14 (Following Directions)
15 (Primary and Secondary Circular Reactions)
16 (Memory)

Factor 2 was predominantly comprised of the following BAMHR item numbers (and names):

1 (Health Status)
2 (Muscle Tone)
5 (Movement Patterns)
6 (Feeding)
7 (Mobility)
8 (Hand Usage)
### Table 7: Principal Factor Analysis of BAMHR Items - Client Item Averages

<table>
<thead>
<tr>
<th>BAMHR Item #</th>
<th>Rotated Factor Pattern</th>
<th>Final Communalities</th>
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<td></td>
<td>Factor 1</td>
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<tr>
<td>1</td>
<td>0.11283</td>
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<td>2</td>
<td>0.18801</td>
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<td>3</td>
<td>0.61525</td>
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<td>4</td>
<td>0.69785</td>
<td>0.43291</td>
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<td>5</td>
<td>0.52863</td>
<td>0.72675</td>
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<td>0.47911</td>
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<td>16</td>
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The factor pattern seems to suggest that Factor 1 is primarily cognitive, while Factor 2 is primarily motor in nature. The cognitive aspects of Factor 1 seem to be primarily related to sensory development, language, socialization, and memory. The motor aspects of Factor 2 relate to the use of the hands, moving the body through space and general muscle tone, which underlies all movement patterns. The loading of Item 9 (Motor Imitation) on Factor 1 may at first seem unusual. However, in examining the
requisite skills for this item, it appears to require less precise motor movement than those items which load on Factor 2. The loading of Item 1 (Health Status) on Factor 2 may also seem somewhat unusual. However, the low communality (.2399) of Item 1 suggests that it is measuring some other dimension. Had there been more health related items, there may have been a third factor on which item 1 may have loaded more strongly.

Factor scores were obtained from each client on both of the rotated factors summarized in Table 7. These factor scores were then correlated with the Bayley, Vineland, and Cattell measures to determine whether there was any evidence of differential (i.e. dimension- or factor-dependent) concurrent validity).

Table 8 depicts the correlations of the factor scores from the BAMHR with the Bayley Mental, Vineland, and Cattell. All correlations between Factors 1 and 2, with the three standardized measures were significant at the .0001 level. In all cases, Factor 1, which is thought to be primarily cognitive in nature, yielded higher correlations with the traditional measures than did Factor 2. Factor 2 is believed to be primarily gross motor and muscle tone related. Present results are not surprising, as the Bayley (mental), Vineland, and Cattell are predominantly cognitive in nature.

**Summary of Results**

Initially, the interrater reliability of the BAMHR was established with intraclass correlations ranging from .8164
Table 8  
Correlations of Factor Scores with Criterion Measures (Bayley Mental, Vineland, and Cattell)

<table>
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<th>Cattell</th>
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<td>$r$</td>
<td>$r$</td>
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Correlations ranged from .9535 to .9284 to .9646. This is an index of the homogeneity of the BAMHR. The above values indicate that the BAMHR is a reliable instrument internally and among raters.

Through examination of descriptive data, the mean age of all residents was calculated to be 33.86 years, with a mean age by facility ranging from 24.81 to 40.32 years. Bayley Mental scores indicate a grand mean of 8.21 months with means per facility ranging from 5.02 to 11.14 months.

Vineland (ABC) scores indicate a grand mean of 10.05 months with facility means ranging from 5.42 to 13.43 months.

Cattell scores yielded a grand mean of 8.14 months, with facility means ranging from 3.29 to 10 months. The BAMHR Adjusted Total scores yielded a grand mean of 7.06 months, with facility means ranging from 6.39 to 8.07 months.
Residents and facilities were very similar based on all measures.

Basic correlations among the four research instruments were computed. The BAMHR Adjusted Total correlated with the Bayley (Mental), the Vineland (ABC), and Cattell at the .0001 level. The BAMHR Adjusted Total correlated with the Bayley (Motor) at the .0034 level. The Bayley (Mental) correlated at the .0001 level with the Cattell and Vineland. The Vineland correlated at the .0001 level with the Cattell. The Bayley (Motor) did not correlate significantly with the Vineland, but did correlate significantly with the Bayley (Mental) (.0216) and Cattell at the .0021 level.

Multiple regression analyses across facilities indicated that the Bayley (Mental), Cattell, and Vineland (ABC), were significant predictors of the BAMHR at the .0001 level. This level of significance was obtained when using the above measures in pairs and when used in a three-way prediction.

Factor analysis data indicated two factors with eigenvalues greater than 1, specifically 9.7204 and 1.6314. Factor 1 was primarily cognitive in nature, with a second, but weaker factor, encompassing primarily motor skills. All correlations between Factors 1 and 2, with the three standardized measures were at the .0001 level.
CHAPTER 5
DISCUSSION

As outlined in Chapter 1, direct care providers within residential facilities for persons considered to be profoundly mentally handicapped do not have a standardized data base by which they can contribute reliably and validly to interdisciplinary team meetings regarding resident planning. This is true despite the fact that they are in almost constant contact with the residents and thus, may know the residents better than other staff members within the facility or by professionals who contract to provide assessment and intervention services as needed.

Traditional psychological assessment procedures used with individuals who are profoundly mentally handicapped were seriously criticized on a number of accounts and delineated in Chapters 1 and 2. Similarly, psychologists' skills and training with respect to the assessment of individuals with profound handicaps was called into question.

A number of investigators (Bigge, 1990; Cleland, 1979; DuBose et al., 1977; Raynes, Pratt, & Rises, 1977; Snell, 1981; Tucker & Horner, 1977) supported the involvement of direct care providers in ongoing assessment and programming for individual who are profoundly mentally handicapped. This is especially important given the low pay, low morale, and
high turnover rates reported among the direct care providers (Zaharia & Baumeister, 1979b; Ganju & Mason, 1982; George, 1980; Zaharia & Baumeister, 1979; Bersani & Heifetz, 1985). These factors all have negative implications for consistent, quality resident care, and for progress in skill acquisition programs.

The Behavioral Assessment of Mentally Handicapped Residents (BAMHR) is a possible vehicle through which direct care providers could collect more accurate data in regard to ongoing resident functioning and allow them a reliable and valid method to contribute to interdisciplinary team meetings. This in turn may provide more precise behavioral targets for intervention.

Interrater reliability results presented in Chapter 4 indicate that direct care providers in facilities for individuals with profound handicaps are highly reliable in their observations of the residents with whom they work. In 6 facilities for individuals with profound mental handicaps, 139 direct care workers completed a total of 845 BAMHR instruments on 169 residents. With a minimum of training—that is, a description of the BAMHR and the need for the study—lasting between 30 and 60 minutes, interrater reliability coefficients between .8164 and .9535 were obtained. While these results may be impressive, it is not surprising since the direct care workers provide services to the residents at a minimum of 8 hours per day, month after month. The regularity, frequency, and ongoing contact
between direct care providers and residents makes them very knowledgeable regarding resident skill levels. Direct care provider contact with residents is in contrast to the irregular and infrequent contact with residents by psychologists, speech pathologists, or physical therapists. It was expected that the residents may perform differently depending upon which "professional" may be assessing them. Information presented by Haskell and Bell (1978), and Whitely and Krenn (1986), indicated low reliability of the Bayley Scales when used to assess individuals with profound handicaps. They suggested that a single administration of the scale would underestimate the behavioral repertoire and called for multiple test sessions. The transdisciplinary model or arena approach advocated by Orlove and Sobsey (1987), and Wolery and Dyk (1984), would do well to include a direct care provider as the primary facilitator during evaluation.

Regarding the traditional assessments of individuals with profound mental handicaps performed by psychologists, the primary researcher noted some unusual practices. Despite the fact that the majority of residents who participated in the study, functioned at or below the 12-month level, the Stanford-Binet Form LM was attempted with many of the residents. While the residents who participated in this study were also administered the Bayley and/or Cattell, there were residents who were only administered the Binet. While the lowest basal level on the Binet is at the 2-year level,
the questionable procedure of "assuming" a basal to be at the 18-month level was frequently employed. Using this procedure, a resident completing one item successfully on the Binet was noted to be functioning at the 19-month level—at best, a clear overestimation of skills. The primary researcher found this procedure employed on a number of occasions. Equally unacceptable was the procedure of administering the Binet and finding the resident to be "untestable" or "formal testing not validly administered" without other direct assessment procedures being used.

Perhaps the most questionable procedure observed in evaluation reports was the use of Wide Range Achievement Test—Revised, to assess individuals with profound mental handicaps. The primary researcher noted several WRAT-R scores of "less than third grade." This grade equivalency was obtained as a result of a raw score of zero on the WRAT-R. Unfortunately, the score of "less than third grade" was noted in the report, while one had to check the protocol to discover that the raw score was zero.

Errors in scoring the Bayley Scales were frequently noted in resident assessment data files. These errors involved incorrect counting of raw score points, inappropriate use of basals and ceilings and assigning incorrect month levels based on raw score points. When the protocols were available, the various scores were checked and corrected when necessary. Unfortunately, protocols were not available for all residents, thus, they could not be checked
for accuracy. For the purposes of this study, the protocols were assumed to be correct.

The charges leveled by Langley (1978) regarding the inadequate training and ability of psychologists to assess individuals with multiple and severe impairments are justified in light of the above findings. Similarly, the data presented by Irons and Maddux (1984), who investigated "perceived competence" among psychologists evaluating individuals with severe handicaps, is not surprising. Of 285 professionals responding, 60% had no university training, while only 10% had 6 or more semester hours in assessing individuals with severe handicaps. When psychologists were polled, 83% indicated they would like more training. The implications are clear; for appropriate assessments of residents with profound mental handicaps, either more university level training and/or more continuing education seminars and workshops should be required.

During the "training" of the direct care providers, many were intrigued by the idea that a psychologist (the primary researcher) felt that they knew the residents better than any one in the facility and could evaluate them as well. While many were intrigued, all felt they did know the residents better than anyone in the facility. Many direct care providers responded that "whenever anyone wants to know something about these clients they ask us."

Correlations across facilities presented in Chapter 4 between the BAMHR and the three other traditional measures,
Bayley, Cattell, and Vineland, were all significant at the .0003 level or better. The fact that the BAMHR correlates highly with the three traditional measures is either good or bad, depending upon the perspective taken. At the very least, it suggests that direct care providers, when given an opportunity to collect data in a standardized fashion on a number of behavioral dimensions, can do so reliably and in a manner which accounts for a substantial portion of the variance of the traditional measures administered by trained psychologists. The Bayley Scales and the Cattell have had support as well as criticism when used as measures of assessment with profoundly handicapped individuals beyond the preschool age. Since the BAMHR does not have the stigma of having been normed on infants, appears to have face validity, and can be used quickly, reliably, and cost effectively by individuals with a minimum of training, it should qualify as an acceptable alternative.

The fact that the BAMHR correlated highly with the Vineland Adaptive Behavior Scales \( r = .7056, p < .0001 \) is not surprising. The Vineland requires an informant (normally the direct care provider) to provide information regarding the resident's skills and is administered and scored by a "trained" professional. The BAMHR may be a less costly, more time efficient alternative to the Vineland.

The poor correlation between the Bayley (Motor) and the Vineland (ABC) \( r = .3269, p < .2542 \) is not surprising, for two reasons. Initially, it is apparent that the Bayley
(Motor) is rarely administered - 19 times, as opposed to 142 Vinelands. Thus, the limited number of Bayley Motor administrations could account for the nonsignificant correlation. Second, the Vineland is composed of four subtests (Communication, Daily Living, Socialization, and Motor). If the motor section was administered, only one quarter of the Vineland is motor in nature, while the remainder is cognitive-social. If the motor section was not administered, then the Vineland is almost entirely cognitive-social.

The evaluation of the motor status of individuals with profound mental and motor impairments using the Bayley or Vineland, is a difficult undertaking. The fact that the Bayley was developed on infants, for infants, is inescapably obvious when the motor portion is administered. The infant has to be lifted and moved through space frequently to administer the items. Lifting a 25-year old adult with severe contractures is a different proposition. Thus, one can see why the Bayley Motor is rarely administered.

Descriptive analysis of the data presented in Chapter 4 indicates the homogeneity of the study population and the similarity of the BAMHR Adjusted Total scores (transformed to months) with Bayley, Cattell, and Vineland scores. Facilities 1, 2, 3, and 5 were comprised of residents who averaged approximately 30 years of age. Residents in Facility 4 had an average age of 24, while residents in Facility 6 averaged 40 years of age. The BAMHR Adjusted
Total scores (transformed to months) ranged from 6.39 to 8.07 months. Across all facilities, the BAMHR Adjusted Total mean score of 7.06 months, compared with a Bayley Mental mean of 8.21 months, Vineland mean of 10.05 months, Cattell mean of 8.14 months, and Bayley Motor mean of 6.62. Thus, the direct care providers using the BAMHR evaluated the residents similarly to psychological professionals using the Bayley, Cattell, or Vineland.

Multiple regression analyses using the BAMHR as the criterion variable with the traditional measures (Bayley, Cattell, and Vineland) used as predictors, taken in pairs and together, were highly significant. These analyses indicate that with a high degree of accuracy, any two of the traditional measures when used together could predict BAMHR results. In other words, the BAMHR could be substituted for any of these measures. Thus, the 16-dimension BAMHR, when used by direct care providers with minimal training, yields results similar to the more time consuming, difficult to administer scales which require extensive professional training and licensing. Similar results were seen using basic correlational procedures. Across facilities, correlations between the BAMHR, Bayley (mental), Cattell, and Vineland, were significant at the .0001 level.

To a great degree, then, what is being measured by the traditional methods is also being measured by the BAMHR. However, as previously noted, the pitfalls typically associated with the traditional measures are avoided. The
BAMHR is specifically designed for use by direct care providers to assess individuals with profound mental and motor handicaps residing in group facilities.

As conceptualized by Bricker and Campbell (1980), their original 19 dimensions were developed as an alternative to the traditional assessment procedures, which when used with students who were multiply and profoundly handicapped, often yielded results that were nonfunctional, nonmeaningful, and costly to obtain. The Bricker and Campbell dimensions were developed in order that behavior could be directly influenced through intervention and education as well as indicating the depth and breadth of intervention required.

The BAMHR, a 16-dimension downward extension of Bricker and Campbell's scale, yielded two factors according to the factor analysis. The first BAMHR factor was a strong cognitive factor, while the second was a weak motor factor. Researchers in future studies may wish to address how the cognitive factor would relate to Bayley, Cattell, or Vineland scores, in an attempt to further streamline the instrument. Thus, the ten cognitive dimensions loading on Factor 1 may comprise a shortened form of the BAMHR with greater utility, ease of administration and cost effectiveness.

It was the hope of Bricker and Campbell (1980) that through the dimensional approach to assessment, more specific areas for intervention would be delineated. Clearly, the substantial interrater reliability coefficients would suggest that dimensions judged similarly weak by various raters would
be primary targets for remediation. Identified strengths could serve as the primary basis for developing interventions. By involving the direct care providers in the data collection phase, and subsequently, in the related planning of the skill acquisition programs (which they ultimately carry out anyway), we may increase the zealously with which daily programs are implemented, to the benefit of the resident.

**Generalizability**

Generalizability of results would extend to facilities for individuals with profound mental handicaps that are staffed by direct care providers. However, the functioning level of individuals with profound mental retardation may range as high as mental ages of four or five years. The vast majority of facility residents in the current study had mental ages of 12 months or less. Thus, the generalizability is limited to individuals with mental ages of approximately 12 months or less. The generalizability of results is also limited by the role of the direct care providers. These individuals provide full services to the residents with profound mental and motor handicaps on a daily basis. The results would not generalize to direct care providers who do not provide services on a daily basis or who have been recently hired by the facility.

Study generalizability is also limited to the Bayley Scales of Infant Development, Cattell Infant Intelligence Scales, and Vineland Adaptive Behavior Scales: Interview
Edition Survey Form. The generalizability to such measures as the Kent Infant Developmental Scales (Stancin, Reuter, Dunn, & Bickett, 1984), and the Mirador (1987) cannot be assumed.

Limitations of the Study

The present study has several limitations. In terms of reliability, there was no practical method to ensure the total independence of the direct care provider ratings of each of the residents. While they were instructed as to the importance of independent ratings, and to not ask colleagues or professional staff to assist them to answer questions, there was no way to ascertain whether or not this occurred. Nevertheless, since it required all facilities a significantly longer period of time to complete the ratings than requested, and facility directors indicated that the completed ratings "dribbled" in, it is felt that, at least for the most part, ratings were independent.

The instructions were that all ratings on a particular resident be completed in two days, although there is again no method to ensure that this occurred. The fact that the intrarater reliabilities were so high is one indication supporting that this instruction was followed. The weak loading of the Health Status domain on Factor 2 may attest to the difficulty direct care providers have experienced when evaluating the health of the residents or that residents were rated on different days or times when they exhibited different levels of health.
The primary researcher noted frequent scoring errors on the Bayley and Cattell. These were corrected when protocols were available to recheck and resource. However, numerous protocols were not available and could not be checked. To the extent that these protocols were incorrectly scored, then the study results should be viewed with some skepticism. The Vineland Adaptive Behavior Scale protocols were partially rechecked. The raw score points for each domain were matched to the appropriate month level. However, the manner in which the raw score points were totaled for each domain was not rechecked. Errors could have been made in scoring. However, the high correlations among the four research instruments suggest that numerous scoring errors were not made.

Recommendations

The fact that the BAMHR is a potentially reliable, valid, and cost effective alternative to such traditional measures as the Bayley Scales, Cattell, and Vineland, is of debatable consequence. The ultimate utility of the instrument should be measured in the degree to which its use increases direct care provider input during habilitation plan meetings, thus, allowing resident intervention plans to be more precise. Further, if the use of the BAMHR allows direct care providers a vehicle to contribute to the habilitation plan meetings in a meaningful manner, they may be viewed as a more valued and integral member of the team. This may result in a more stable and motivated work force thereby minimizing the long standing turnover rate problems. The hope is that
the attitude and perceived self-worth of direct care providers would ultimately result in improved resident care and functioning. Further studies will need to delineate whether the use of the BAMHR:

   a) increases direct care provider participation in habilitation plan meetings,
   b) allows for more precise individual intervention plans to be written,
   c) improves direct care provider status and morale within the facility,
   d) decreases direct care provider employment turnover rate,
   e) improves resident care, and
   f) results in higher resident functioning levels.

Additional studies may also be needed to address the weak loading of the Health Status dimension on Factor 2. The incorporation of additional items to measure resident health may reveal the existence of a third factor. The present BAMHR does not incorporate items measuring humor or aberrant behavior. To the extent that future investigators wish to assess those qualities in this population, dimensions measuring humor and aberrant behavior could be included in the BAMHR.

Most facility staff members and directors would probably favor a BAMHR comprised of fewer, not additional dimensions. Thus, future investigators may best serve clinical practice by assessing to what degree the present BAMHR Factor 1
(cognitive dimension) relates to the traditional measures. Should they relate in a meaningful manner, then an even more cost effective, practical instrument would be available.

In this study, it has been determined that the BAMHR has the potential to influence the quality of assessment and intervention for residents with profound mental and motor handicaps, as well as the mental health and contributions of direct care providers. This study is one of the first in the area of school psychology to indicate that there are more appropriate assessments than the traditional infant measures, Cattell and Bayley, and more appropriate evaluation procedures of group facility residents than those conducted by contract or multifacility psychologists who evaluate without ongoing daily knowledge of the residents with profound disabilities. A partnership between psychologists and direct care providers is suggested and would provide a solid basis for appropriate evaluation and intervention for each client thus constituting professional best practice in school psychology.
APPENDIX A

BEHAVIORAL ASSESSMENT OF MENTALLY HANDICAPPED RESIDENTS (BAMHR)
Behavioral Assessment of Mentally Handicapped Residents

Purpose:

Direct care providers in an ICF/MR Developmental Medical Facility are intimately involved in all aspects of client life. This close involvement, coupled with the amount of time spent with individual clients has facilitated a broad knowledge base regarding clients' skills, strengths and weaknesses. In the development of habilitation plans, the various consultants (i.e., psychologist, recreation therapist, physical therapist, etc.) evaluate clients and develop various goals. The role direct care providers play in that process may or may not be significant. Because of the nature of the consultants' assessments (i.e., time factor, familiarity - or lack of it - with the client), important information may be missed or overlooked.

This scale was developed in order to involve direct care providers in the assessment process and to provide more appropriate information regarding client strengths and weaknesses, possible intervention strategies and relevant areas where programs could be developed. Perhaps, by working together, a more appropriate, and thorough assessment of clients will be obtained. This scale may supplement standard assessment procedures or eventually may replace them. Help is needed and requested. Comments to improve the scale will be appreciated and are sought.

Directions:

The following scale should be read very carefully. The client will be rated along a number of behavior dimensions which have probably been observed in working with the client. If the particular skill or behavior has not been observed, or if there is some uncertainty regarding it, procedures will be described that will allow observation of that skill or behavior. Please follow those procedures. Also, please establish a good working relationship or "rapport" with the client before beginning the procedure.

Each dimension is rated from one to five - one being the lowest skill or behavior and five the highest. The client must perform all skills or behaviors at a particular level in order to receive that level rating. Please circle the rating in pencil that is felt to be most appropriate for the client. This rating should reflect the highest skill the client can definitely perform. Should the behavior being rated seem to fall between two number ratings (i.e., "he's more like a 3-1/2 than a 3 or 4"), the client's behavior must be given the lower of the two ratings. In the example, he would be
given a "3." Individual direct care provider responses are being sought. Do not ask other staff what they think or how they rated. Questions should be directed to the primary researcher. How valid the scale is may depend on each rater working independently of the raters. Further, clients can best be served by working independently.

Client Initials: _______  Date of Rating: _______

Facility Initials: _______  Rater: _______

How often have you provided services to this client? (check one)
Daily __  Weekly ____  Monthly ____  Never ___
HEALTH STATUS (1)

This dimension assesses the client's state of physical health within the last year. The implications for high and low scores could indicate, respectively, the degree of accessibility and receptivity to skill acquisition programming or the level of medical intervention necessary to sustain life.

Cue: Within the past year, the client:

1. Required constant day-to-day monitoring with regard to health (especially respiration, infection, blood pressure, temperature, etc.) and has experienced several hospitalizations for acute situations.

2. Was generally considered very fragile and often in an acute health state.

3. Had frequent illnesses which require monitoring. These include: colds, infections, temperatures (elevated or decreased), impactions, etc.

4. Was generally quite healthy, but sick more often than in #5.

5. Was not usually sick (confined to bed rest for more than one or two days at a time) i.e., just a slight elevated or decreased temperature or cold, etc. This has not occurred more than two times this year. Generally healthy.
MUSCLE TONE (2)

Assessed in this dimension is the degree of tension observed in the body muscles of the client. Since body muscles provide the basis for movement, an idea will be obtained regarding the level of intervention that may be necessary by a PT or OT, as well as the practicality of certain skill acquisition programs.

Cue: In day-to-day observations of the client, he/she has been observed to:

1. Exhibit no voluntary (or purposeful) movements of head, arms or legs. Rater has never observed evidence of voluntary movement and has always seen the client in a hypotonic (floppy) or hypertonic (tight) state.

2. Be, usually, extremely hypo or hyper tonic, but the direct care provider has noted voluntary movement of head, legs, or arms in rare instances.

3. Exhibit extreme hyper or hypo tonicity on occasion, while on other occasions he/she can exhibit more normal tone and movement of head, legs and arms.

4. Usually exhibits good control of tone, but the direct care provider has noted some degree of hypo or hyper tonicity in a few circumstances.

5. Exhibit voluntary control of head, legs and arms on a regular basis. Client has good control of body movement, not hypo or hyper tonic.
VISION (3)

This dimension assesses the client's receptivity to visual stimuli. Information obtained here may allow one to make some decisions regarding the client's involvement in visual stimulation activities.

**Cue:** Given appropriate circumstances and client looking at direct care provider, direct care provider waves and smiles at client. Provider should not provide any verbal cues.

1. Direct care provider believes client cannot see at all or has never seen a behavior that would indicate that client can see.

2. Client blinks when direct care provider waves hand in front of eyes (12-18 inches). (Do not create a detectable air current with your hand!)

3. Client obviously responds by looking at direct care provider, smiling or moving when provider smiles and waves from 18-36 inches away.

4. Client obviously responds by looking at direct care provider, smiling or moving when provider smiles and waves from 10 feet.

5. Essentially normal vision. Client obviously responds by looking at direct care provider, smiling or increased movement when direct care provider smiles and waves at client from 20 feet.
HEARING (4)

Assessed in this dimension are the direct care provider's perceived thoughts regarding the client's ability to receive auditory input from the environment. Thus, information will be obtained to aid in the determination of the client's ability to profit from auditory stimulation activities.

**Cue:** In day-to-day observations of the client, he/she:

1. Has never given direct care provider any evidence that he/she can hear. Direct care provider believes client cannot hear.

2. Startles to a loud noise or normal voice by sudden jumping movement, eye widening or eye blinking.

3. Localizes to sound at his side. Turns (eyes or head) toward sound at side without sound source in visual field.

4. Localizes to sound at side and below ear level without sound source in visual field. (Turns eyes or head toward sound.)

5. Displays essentially normal hearing. Direct localization to sound in any direction. Resident can find sound source above, below and to the side with a head turn (or eyes turn) without sound source in visual field.
MOVEMENT PATTERNS (5)

Assessed in this dimension is the client's ability to make goal directed functional movements. Also obtained is an idea regarding the client's ability to satisfy some needs through motoric action.

Cue: When presented with desired object 12 inches from hands and given appropriate verbal cue (i.e., "Do you want this?" "Would you like to play with this?") (For blind clients, place object in their hand first, then remove it.), client:

1. Makes no attempt to move and direct care provider believes client was unaware stimulus was even presented.

2. Attempts to move toward object in an uncoordinated random fashion within 30 seconds after it was presented, but after 30 seconds still has not touched object.

3. Attempts to reach for object and moves toward object in an uncoordinated but not random fashion and touches object within 20 seconds.

4. Reaches toward object in a manner showing more coordination that in #3 and, in addition, grasps object within 10 seconds.

5. Will reach out and grasp object within 5 seconds.
FEEDING (6)

This dimension assesses the degree to which the client is, or could be trained to be, independent in self-feeding. In addition, the degree of direct care provider assistance needed by the client in order to eat is determined.

**Cue:** Given appropriate circumstances, direct care provider presents filled spoon to client's mouth and says, "Hey, ______, open your mouth and taste your food," or provider presents spoon to client and says, "Okay, ______, it's time to eat." The "time to eat" sign can be given to deaf clients.

**Response Time:** 20 seconds for #4 and #5.

1. When positioned for feeding and spoon is put near mouth, client does not open mouth or he/she is fed by a N/G tube.

2. Client regularly opens mouth when spoon is presented to lower lip and swallows food within 10 seconds of placement of mouth.

3. Client regularly opens mouth, sucks strained food off spoon and swallows within 10 seconds when spoon is held.

4. Client uses spoon by himself in feeding, spilling part of contents frequently while attempting to feed self. Client chews food well. Blind clients can be oriented as to the position of their food.

5. Client uses fingers appropriately and spoon appropriately in feeding, spilling part of contents on occasion. Client chews well. Blind clients can be oriented as to the position of their food.
MOBILITY (7)

Assessed in this dimension is the client's ability to move his/her body and to move from one location to another in the environment, regardless of the form which that mobility takes.

Cue: In day-to-day observations, the client has been observed to be:

1. Totally dependent on staff for all mobility and is unable to change body position. A wheelchair is used for all transportation and it must be propelled by someone else.

2. Totally dependent on staff for all mobility but can reposition self by turning to side and moving head (e.g., when in chair and slumps to side, can get back to midline position). The wheelchair used for transportation must be propelled by someone else.

3. Capable of rolling stomach to back and back to stomach to increase environmental awareness or reposition self; or, the client can perform wheelchair transfers with some assistance.

4. Regularly performing as in #3 and has been known to change position by as much as 3 feet by any of the methods in #5. Or, the client can perform wheelchair transfers independently.

5. Client is self-mobile for at least 10 feet by any of the following means: self-propelled wheelchair either by the use of feet or hands; electric wheelchair; walking (with any appliance); knee walking; crawling; or scooting.
HAND USAGE (8)

The degree of self-directed motor movement of the hands are assessed in this dimension. Ideas regarding the client's receptivity to motor skills training, game activities and possibly self-feeding will be obtained.

Cue: Direct care provider presents a favorite toy or object to the client and says, "Show me what this does."

Response Time: 15 seconds

1. No response. Client gives provider no indication he knew a stimulus was presented. (If object is placed in hands of client, it will be dropped.)

2. Client will not or cannot reach for object, but will hold it (voluntarily) if placed in his hand.

3. Client holds toy presented to hands and manipulates it.

4. Client reaches for, grasps toy and manipulates it (as in waving it back and forth).

5. Client reaches for and grasps toy, manipulates object well, and transfers object hand to hand.
MOTOR IMITATION (9)

The degree to which a client can imitate a specific motor act performed by a direct care provider is assessed by this dimension. Assessment in this area allows one to make a determination as to how much shaping or graduated guidance might be necessary to teach a client a skill of similar difficulty as shown in cue.

**Cue:** Given an appropriate situation, direct care provider talks to client and waves "bye-bye" for 10 seconds (e.g., "I'm leaving now. Good-bye.").

**Response Time:** 15 seconds

1. No response to stimuli observed. Provider is not sure if client knew any stimuli were presented.
2. Client looks at provider at least one second.
3. Client looks at provider, smiles and/or laughs. No extremity movement noted.
5. Client imitates provider's action with a "bye-bye" motor response.
VOCALIZATIONS (10)

This dimension assesses the range of speech and non-speech vocalizations. Directions for an appropriate communication-language intervention or vocalization program may be determined.

**Cue:** In daily observations, the client:

1. Does not make *any* audible vocalizations. Not even a cry.
2. Only vocalizes a groan or cry when uncomfortable or hungry.
3. Vocalizes pleasurable sounds when talked to by staff.
4. Vocalizes actively whether or not he is stimulated by staff, shows inflections, several syllables and sequences of sounds.
5. Says at least two understandable words.
VERBAL Imitation (11)

A dimension of the client's receptive and expressive language skills is assessed here. Samples of the client's verbalizations may assist the speech pathologist in determining an appropriate communication-language intervention or verbalization/vocalization program.

**Cue:** Given appropriate circumstances, provider asks the client to say a one-syllable word such as "cat." If within 15 seconds there is not a response, provider again presents stimuli (e.g., "Johnny, say "cat").

**Response Time:** 15 seconds

1. Client shows no response. Trainer believes client was not aware a stimulus was presented.

2. Client smiles at provider and/or or shows an increase in activity or shows attentiveness.

3. Client responds with any type of vocalization including laughter.

4. Client responds by saying the initial, middle or final sounds of the word (i.e., the "c" sound, "a" sound or "t" sound). Also, if client mouths the word without any vocalization, give credit.

5. Client clearly articulates the word presented. Provider is sure that the client repeated the appropriate word.
This dimension assesses the client's receptivity to a range of reinforcers and the extent to which the behavior of the client can be positively influenced by these reinforcers, or how much effort the client will put forth to attain reinforcement. As a result of this knowledge, training can be more efficiently accomplished and with greater sensitivity.

**Cue:** In day-to-day observations, the client has:

1. Not shown the ability to respond positively to any type of reinforcing consequence. Does not show a preference for any object, food, activity, environment or person and will not "work" for them.

2. Shown interest or preference for only one type of reinforcer (food, object, activity or person) but will not put forth effort to obtain that reinforcer.

3. Shown interest or preference for two or more types of reinforcing consequences and has put forth, on occasion, effort to obtain the positive reinforcer.

4. Regularly put forth effort in order to obtain two or more types of reinforcers.

5. Shown interest to a large range of reinforcing consequences (edibles, fluid, social, activities, etc.) on a daily basis and will put forth effort to attain those positive reinforcers. Client's behavior can be positively influenced through the use of these reinforcers.
SOCIAL RESPONSIVENESS (13)

This area indicates the client's need for and interest in social relations or interactions with others, as well as differentiating himself/herself from others. Through this assessment, training at the proper level will be assured, as well as providing the client with social reinforcement.

**Cue:** When given appropriate circumstances, provider greets client by touching and saying "Hi, _____, how are you doing today?" For deaf client, appropriate sign is given.

**Response Time:** 15 seconds

1. No response. Client shows no evidence of responding to direct care provider. Provider is unsure client was even aware stimulus was presented.

2. Client gives some evidence of recognition, such as a quick head turn, a glance at provider, or laughter.

3. Client shows excitement by kicking, flapping arms, smiling (no true looking or eye contact required).

4. Client looks, establishes eye contact, smiles and vocalizes to provider.

5. Client looks, establishes eye contact, and smiles and/or vocalizes to provider. Client also makes motor movements, such as a waving of hand or arm which cues the provider to stay and continue the interaction.
FOLLOWING DIRECTIONS (14)

This dimension assesses the client's willingness to respond to instructions, such as following directions, making appropriate responses to environmental cues and allowing physical guidance. Possible client difficulties needing behavioral intervention may be obtained.

Cue: Given an appropriate circumstance, and client requested by the provider to follow a simple one-step command, such as "Look at me," "Open your mouth," "Stop that," or "Don't do that:" (Commands can be signed for deaf clients.)

1. Client does not respond. Provider has no reason to believe client is aware a stimulus was even presented.

2. Client usually does not respond, but on occasion will respond to a request involving food or will cease activity to "No, stop that," if said loudly. For deaf clients, they will respond on occasion to visual cues that require them to begin or stop an activity.

3. Client responds to simple requests about half the time and will allow physical guidance to assist in responding without resistance the rest of the time. Deaf clients will respond to visual cues (signs) half of the time.

4. Client responds to simple requests about 75 percent of the time and will allow physical guidance to assist in responding without resistance the rest of the time. Deaf clients respond to visual cues (signs) 75 percent of the time.

5. Client follows requests within 15 seconds. Client, for the most part, complies with provider requests.
PRIMARY CIRCULAR REACTION AND SECONDARY CIRCULAR REACTION

(15)

This dimension assesses the degree to which a client shows intercoordination among various behavior patterns. Can the client demonstrate self or internally directed responses in which he/she manipulates his/her own body (thumbsucking, hand watching) or can he direct those response toward the manipulation of external environments (swiping at a mobile to activate it, pushing an object to receive auditory stimulation)? Level of programming and types of stimulation or reinforcing activities may be obtained.

 Cue: In day-to-day observations:

1. Client seems unaware of internal or external environment. Only performs reflexive responses to stimuli and does not respond to normal interactions.

2. Client regularly performs reflexive responses to stimuli and in rare instances will engage in behaviors such as in #3.

3. Client repeatedly performs hand-to-mouth behaviors, hand watching, playing with hands or stereotypic behavior (spitting, rocking, hand movements).

4. Client typically performs behaviors stated in #3 and in rare instances will engage in behaviors stated in #5.

5. Client will regularly repeat his or her actions to maintain the reinforcing consequences produced by those actions. Client will bat at a mobile, bang objects together to make noise, pull an object to hear it make noise, kick or vocalize in order to have provider continue tickling, feeding, etc.
MEMORY (16)

This dimension initially assesses a prerequisite to memory - attention span - as well as a client's understanding that objects (persons) exist independent of both visual presence and immediate actions with them. (A gauge as to the client's ability to learn and profit from previous stimuli can also be obtained, as well as the degree of shaping or graduated guidance necessary to teach a particular skill.)

Cue: In an appropriate situation, when client is stimulated by a provider for 3 minutes, and the provider then leaves the client, the client will:

1. Show no awareness that provider has left the situation.

2. Client is aware of interaction, but as soon as interaction ceases, client resumes previous behavior.

3. Client visually tracks provider as he/she is leaving, then looks away or engages in another activity. Blind clients vocalize as provider leaves situation.

4. Client visually fixates on the spot where the provider disappeared. Blind clients continue to vocalize after provider has been gone in an attempt to gain provider's attention.

5. Client visually fixates, vocalizes and moves in an attempt to look for provider who just left area of client. (Attempts search for recently absent stimulus.) Blind clients continue to vocalize, and move (i.e., hand search) in an attempt to gain provider's attention.
APPENDIX B
DATA SHEET
Rater only completes starred (*) items.

DATA SHEET

*CLIENT NAME: ______________________   DATE OF BIRTH: ______
*RATER: ___________________________   *DATE OF RATING: ________
*RESIDENCE: ________________________
YEARS AT THAT RESIDENCE: _________
TOTAL YEARS IN RESIDENCE: _________
*RATER'S EXPERIENCE WITH CLIENT ___ YEARS ___ MONTHS

MEDICAL DIAGNOSIS:  1.  3.  
          2.  4.

MEDICATIONS:  1.        2.        3.

VISUALLY IMPAIRED: Yes___ No___   HEARING IMPAIRED: Yes___ No___

PREVIOUS PSYCHOLOGICALS:

Test: ____________________________ Date____  MA________
Test: ____________________________ Date____  MA________
Test: ____________________________ Date____  MA________
APPENDIX C
MULTIPLE REGRESSION: BETA WEIGHTS BY FACILITY
(USING PAIRS OF PREDICTORS)
## Multiple Regression: Beta Weights By Facility

(Using Pairs of Predictors)

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APPENDIX D
MULTIPLE REGRESSION: BETA WEIGHTS BY FACILITY
(USING ALL PREDICTORS: BAYLEY, VINELAND, CATTELL)
### Multiple Regression: Beta Weights By Facility
(Using All Predictors: Bayley, Vineland, Cattell)

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REFERENCES


TASH Subcommittee on Services for Students with Multiple and Profound Handicaps (1987). Chicago, IL.


BIOGRAPHICAL SKETCH

Michael Anthony Sisbarro was born on April 1, 1954, in Newark, New Jersey. Although his interest in sports was encouraged by his parents, a pro career was not forthcoming.

Upon graduation from Irvington High School in 1972, he attended Fairleigh Dickinson University as a freshman and then transferred to the University of Miami where he graduated in 1976 with a B.A. in psychology. He completed a M.S. degree in psychology in 1979 from Florida International University. His doctoral career began in 1981 at the University of Florida in the area of school psychology.

Michael Sisbarro is a Florida state licensed and nationally certified school psychologist. Since coming to the Jacksonville area in 1979, he has been employed as a psychologist with the Duval County School System, the Pediatric Department of Shands Teaching Hospital (University of Florida) and has been in private practice at 3601 Hendricks Avenue, with Kaplan and Associates since 1985. He has served as a consultant to HRS, Headstart and University Hospital Developmental Clinic and has presented numerous teacher and parent workshops on relevant child development, behavioral and educational topics.

Michael's areas of clinical interest include working with families and children who are experiencing emotional,
behavioral, social and academic difficulties. He is interested in the psychological assessment and treatment of learning disabilities, ADHD, conduct disorders and oppositional children. He has interest in assisting parents to make prudent educational decisions for their children and in assisting parents in making promotion/retention decisions. Other interests include assessment and treatment of the multiply handicapped child.
I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Mary K. Dykes, Chair
Professor of Special Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Larry C. Loesch
Professor of Counselor Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Cecil D. Mercer
Professor of Special Education

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

May 1993

Dean, College of Education

Dean, Graduate School