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A Comparison of Two Techniques for Assessing the Profoundly Retarded: Emphasis on Intervention

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A COMPARISON OF TWO TECHNIQUES FOR ASSESSING THE PROFOUNDLY RETARDED: EMPHASIS ON INTERVENTION

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B.G.H.

INTRODUCTION

One of the major goals in the treatment of profoundly retarded, physically handicapped individuals in our society today is to improve the quality of their life. Good medical care and human treatment may be assumed. But our responsibility as a humanitarian society goes far beyond the daily routine of feeding, bathing, and dispensing medications. These individuals, most of whom depend solely on others for their simplest needs, deserve to reach their highest potential in all areas of human functioning - physical, mental, and emotional.

In a residential facility, the psychologist is concerned with helping the profoundly retarded individual to reach his or her potential in the area of mental, or cognitive, functioning. This requires the development of therapeutic programming, or intervention packages, geared to the needs of that particular individual. This programming necessitates both accurate assessment of current level of cognitive functioning and knowledge of individual strengths and weaknesses.

The profoundly retarded have traditionally been assessed with standardized intelligence tests, primarily the Bayley Scales of Infant Development (Bayley, 1969). Although traditional intelligence tests provide the psychologist with an estimate of cognitive functioning, they do not provide sufficient information on which to base programming. In addition, traditional tests are based on chronological age. They group tasks according to the age at which

most normal individuals achieve them. Since profoundly retarded individuals function within the sensorimotor stage of development (0-2 years) throughout their lives (Woodward, 1959; Inhelder 1943/1968), this emphasis on chronological age is inappropriate. For these reasons and others to be discussed in this paper, ordinal scales based on Piaget's sensorimotor stages are becoming increasingly popular for assessment of cognitive functioning in the profoundly retarded.

The fundamental difference between traditional and ordinal scales is that ordinal scales make no assumptions concerning chronological age. They are based instead on a progression of accomplishments. Their emphasis is on the achievement of the task itself rather than at what age it occurs. This is extremely important when dealing with the profoundly mentally retarded individual. The psychologist responsible for designing therapeutic programming for such an individual must know that individual's strengths and weaknesses.

In recent years, several ordinal scales have been developed to provide this type of qualitative information (Corman and Escalona, 1966; Casati and Lezine, 1968; Uzgiris and Hunt, 1975). The most frequently used of these scales is the Uzgiris-Hunt Ordinal Scales of Psychological Development constructed by Ina Uzgiris and J. McV. Hunt in 1975 (Kahn, 1979). The Uzgiris-Hunt Scales have been shown to be a reliable and valid instrument for assessing normal children (King and Seegmiller, 1973; Uzgiris and Hunt, 1975; Wachs, 1975; Siegel, 1981). However, little research has been conducted demonstrating its reliability and validity with

the profoundly retarded. Of the studies which have been done (Silverstein, Brownless, Hubbell, and McClain, 1975; Kahn, 1976; Wachs and DeRemer, 1978; Barenbaum, 1980; Dunst, Rheingrover, and Kistler, in press), most have correlated individual scale scores with scores on other instruments or have combined subjects who were moderately, severely, or profoundly retarded. This paper will present a study conducted at a state institution for the developmentally disabled which is different from the past research in two ways. First, it compares total scores on the Uzgiris-Hunt Scales with total scores on the Bayley. Second, the subjects are all profoundly retarded, multi-handicapped individuals. This type of research is needed if we intend to utilize the Uzgiris-Hunt Scales in programming with this population. If it can be shown to be a reliable and valid instrument for assessing the profoundly retarded, and if indeed it measures the same construct as the Bayley, that of cognitive functioning, then it is a valuable tool in two ways. It can replace the traditional intelligence test by providing a similar quantitative measure of cognitive functioning and it can at the same time provide the additional qualitative data necessary for programming.

The purpose of this paper is to demonstrate the value of the Uzgiris-Hunt Ordinal Scales of Psychological Development (1975), first, by providing empirical data supporting its reliability and validity and second, by describing its clinical use.

Chapter 1 will review the background and construction of the Uzgiris-Hunt Scales and the theory on which they are based. Chapter 2 will review the research conducted by Uzgiris and Hunt and other

investigators with these scales. Chapter 3 will present the study conducted by the writer which provides empirical data supporting the use of the Uzgiris-Hunt Scales with profoundly retarded individuals. Chapter 4 will discuss a method of designing intervention packages based on the results of Uzgiris-Hunt Scale assessments. Finally, Chapter 5 will conclude the paper by summarizing the important considerations regarding assessment of the profoundly retarded, physically handicapped individual.

CHAPTER 1

BACKGROUND AND THEORY

In order to understand the need for the Uzgiris-Hunt Ordinal Scales of Psychological Development (1975) for assessment and treatment of the profoundly retarded, we must first examine the problems involved with using a traditional intelligence test with this population. Then we must study the theory on which the Uzgiris-Hunt Scales are based to provide an understanding of how they were conceived and constructed.

This chapter will discuss the Bayley Scales of Infant Development (1969), the traditional test most often used with a profoundly retarded population. It will review Jean Piaget's theory of cognitive development with emphasis on the sensorimotor stages. And finally, it will describe the Uzgiris-Hunt Scales in detail.

Bayley Scales of Infant Development

The Bayley Scales of Infant Development (Bayley, 1969) have been widely used for many years for the purposes of assessment and prediction in individuals two to thirty months of age and are recognized as outstanding in their technical quality (Anastasi, 1976).

The Bayley yields two developmental indices, a mental age (Mental Development Index) based on results of the Mental Scale,

and a motor age (Psychomotor Development Index) based on results of the Motor Scale. The Bayley also includes an Infant Behavior Record which assesses such characteristics as cooperativeness, tension, attention span, and endurance, among others. For the purposes of this paper, we are concerned only with the Mental Scale.

According to the manual (Bayley, 1979, p.3) the Bayley Mental Scale assesses:

> "...sensory-perceptual acuities.....'object constancy,' and memory, learning, and problem-solving ability; vocalizations and the beginnings of verbal communication; and early evidence of the ability to form generalizations and classifications which is the basis of abstract thinking."

But several problems are involved in applying this definition to the profoundly mentally retarded and in using a traditional assessment instrument such as the Bayley to measure cognitive functioning in this population.

First, because of its strict adherence to specific stimulus objects, the Bayley may not always permit the examiner to determine the individual's true sensory-motor abilities. This is particularly a problem with the profoundly retarded, severely handicapped individual. The prevalence of palsy and other physical conditions causing deformities of the hands results in difficulty in grasping objects of certain shapes. This problem is further complicated by individual preferences for certain objects over others. Karlan (1980) has shown that preference for one object over another is significantly related to intrinsic motivation and thus better performance on tests.

Second, fourteen out of the first twenty items of the Bayley require vision. Many individuals who are profoundly retarded are also blind or have difficulty in seeing. With such individuals, it is unlikely that an accurate estimate of cognitive abilities could be obtained with the Bayley.

Third, the Bayley was standardized on "normal" children between the ages of two and thirty months (Bayley, 1969). In order to determine a mental age for a severely or profoundly retarded child, one must use the "age equivalence" method described in the manual. This is accomplished by "...looking across the rows corresponding to an MDI...of 100 to find the age group column in which the given raw score is nearest to that obtained by the child" (Bayley, 1969, p.33). The age at the top of the column corresponding to the raw score is the "mental age" or "age equivalent." Although this method is satisfactory for determining a mental age, it does not yield an MDI that differentiates moderate, severe, and profound retardation. It implies that a child with an MDI below 50 would function similarly to a normal child of the corresponding age equivalence regardless of chronological age. Bayley cautions examiners that "...functional abilities of exceptional children have patterns which are very different from those of normal children." (Bayley, 1969, p.34) It should be noted that the theory that retarded children develop differently than normal children is still being debated (See Barenbaum, 1980, for review of the current research on this topic). Bayley (1969) suggests that age equivalency scores be supplemented with a <u>qualitative</u> analysis of the results, evaluating particular strengths and weaknesses of the individual.

It should be understood that the Bayley is an excellent scale for assessing the developmental status of normal infants. However, the assessment of cognitive functioning in the profoundly retarded individual necessitates the use of a more flexible instrument which will yield information on which to base therapeutic programming. To accomplish this, we need both a mental age, as provided by the Bayley Scales, and a method of determining the strengths and weaknesses of each individual.

Piaget's Theory of Cognitive Development

Jean Piaget viewed development as a continuous process, with each level proceeding from the previous one and being incorporated into the subsequent one (Maier, 1965). Each level involves repeating the processes learned in the preceding level with the additional ability to organize them in a superior way. These differences in organization provide a pattern or hierarchy of experiences, which Piaget labeled "phases" (Piaget, 1952). (It should be noted that in Piaget's own writings, he indiscriminately interchanges the terms "phases" and "stages." Most authors use the term "phase" for the three major periods from birth to adulthood and the term "stage" for the various levels within each phase. These terms will be used in this way in this paper.) These phases, and the stages and sub-stages within them, have provided psychologists and educators with a convenient structure for analyzing a child's cognitive development.

Piaget originally believed that language (i.e., questions asked by the child and the child's answers to particular questions) would provide the source for understanding cognitive development. He explained (Piaget, 1952) that this idea was based on the belief that thought proceeds from action. Later on, as he studied the patterns of development in the first two years of life, Piaget realized that in order to understand the origins of the intellect, he would have to examine the child's manipulation of and experience with objects (Piaget, 1952).

The births of his own three children gave Piaget the opportunity to observe, record, and evaluate behavior from birth to the teen-age years. These meticulous recordings of his research are respected by many as a mammoth undertaking and an outstanding achievement (Flavell, 1963; Maier, 1965; Inhelder, 1943/1968). Although there has been some opposition to his concept of stages of development (Furth, 1973; Barenbaum, 1980), Piaget's overall theory is widely accepted by psychologists and educators as a sound structure for research, educational planning, and assessment.

Piaget formulated a "developmental plan" (Flavell, 1963) consisting of three phases. Piaget (1952) emphasized that the ages at which these phases occur are not absolute and can vary with each individual child.

(1) Sensorimotor intelligence (0-2 years), during which time the infant moves from a state of reacting to his environment on a purely reflexive level to combining sensory-motor actions in order to affect his environment. This phase is further divided into six stages, which will be examined in detail later.

(2) Preparation for, and organization of, concrete operations (2-11 years), which is divided into two subphases:

(a) Preoperational representations (2-7 years), during which the child begins to understand the things around him, but still operates from an egocentric point of view.

(b) Concrete operations (7-11 years), during which the child begins to organize his adaptations to the environment and to stabilize his concepts of reality.

(3) Formal operations (11-15 years), during which the child develops the ability to deal effectively with reality and to understand abstract statements.

Since this paper deals only with profoundly retarded individuals, whose cognitive ability can be measured in terms of sensorimotor stages (Woodward, 1959; Inhelder, 1943/1968; Dunst, 1980), this discussion of Piaget's theory will focus on the phase of sensorimotor intelligence.

Sensorimotor Intelligence

Piaget (1952) divided the sensorimotor phase into six stages. These stages, although separate, are not all-inclusive. Each one is characterized by the behavior that has just become operative, although other behaviors from the prior or subsequent stage may also be operating (Phillips, 1969).

Stage 1: The use of reflexes (0-1 month)

This stage is marked primarily by the infant's reflexive responses to stimuli in his environment. His behavior consists of sucking, crying, gross bodily movements, and other purely reflexive reactions. Although Piaget did not spend a great deal of time examining the behaviors of this stage, he did consider it important as a foundation for later development (Flavell, 1963). During this stage, the infant is developing a rudimentary form of organization. For example, he begins to distinguish between nourishing and non-nourishing stimuli as shown by his sometimes adamant rejection of the latter when he is hungry.

Stage 2: Primary circular reactions (1-4 months)

The primary circular reaction is one of three types of circular reactions: primary, secondary, and tertiary. Secondary and tertiary reactions occur during later stages. Flavell (1963) makes the distinction that the primary circular reaction is different from secondary and tertiary reactions in that it is centered primarily around the infant's own body. These reactions are called "circular" because they are repeated endlessly. Examples of types of circular reactions occuring during Stage 2 are: hearing and looking, reaching and grasping, seeing the nipple and sucking. The primary circular reaction of this stage refers to a repetition of a sensory-motor response. The distinction at this level according to Piaget (1952) is that there is no intention to the action. After one or more similar unintentional actions, the infant begins to repeat the behavior. As the sequence continues,

a "schema" develops and becomes firmly established as part of his intellectual development.

Flavell (1963, p. 52) defines "schema" as "...a cognitive structure which has reference to a class of similar action sequences, these sequences of necessity being strong, bounded totalities in which the constituent elements are tightly interrelated." Maier (1965) describes a schema in simpler terms. He states that it is a behavioral event, or relationship pattern, which is repeated and then coordinated with other behaviors. According to Piaget (1952) a schema is formed by an "ensemble of sensorimotor elements" which cannot function without each other.

Stage 2, then, is characterized by the establishment of various schemas developed through the occurence of primary circular reactions. These reactions are different from pure reflex, as in Stage 1, but they cannot yet be considered intelligent behavior because reaction precedes intention (Piaget, 1952).

Every schema, no matter how elementary or complex, encompasses two processes called "assimilation" and "accommodation." Together these two processes are involved in all forms of the human organism's "adaptation" to the environment (Maier, 1965). Assimilation is the act of incorporating into an existing cognitive structure any new external stimuli. Just as the human body assimilates food by changing it into a form which can be absorbed and used, the human mind assimilates new experiences through "cognitive structuring or restructuring" (Flavell, 1963). Accommodation is the process of adapting cognitive structures to the external stimuli. Again using the example of ingestion,

the body accommodates itself by readying the mouth and stomach in preparation to receive food. Cognitively, the brain adjusts (accommodates) its perception of reality each time a new stimuli is incorporated (assimilated) into its structure.

During Stage 2, the schemas which are developing from the interaction of these two processes are doing so without the conscious awareness of the infant. There is no intention involved. At this point, both the schemas and the alterations in these schemas take place merely as a function of experience (Flavell, 1963).

Stage 3: Secondary circular reactions (4-8 months)

The secondary circular reaction is so-called because of its emphasis on surrounding objects as opposed to one's own body and, as in all circular reactions, because of its repetitive nature. In this stage, we see the beginning of intentional behavior. The schemas which are developed during Stage 3 are made possible by the infant's increased visual-motor coordination. If he accidently creates an interesting sight by kicking his mobile, he can now intentionally create the sight again. He can direct his hand toward an object to grasp it. During this stage, the infant is beginning to form the concept of object permanence, i.e., "...that an object has a permanence beyond our immediate perception of it" (Phillips, 1969). He will search for an object when it disappears from his field of vision, but only for a moment. Also in Stage 3 comes the beginning of a concept of "general space" (Phillips, 1969). This is brought on by the infant's ability to move around and his increased interest in objects. He begins to explore the

relations between objects and because of his increased coordination is able to discover the properties of objects dealing with space.

Stage 4: The coordination of secondary schemas (8-12 months)

In Stage 4 the secondary circular reactions which occurred during Stage 3 begin to be differentiated. When the infant tries to perform an action and is confronted by an obstacle, he will attempt to push away the obstacle. The schema of pushing away is done intentionally in order to reach the desired object. Thus two schemas, pushing away and reaching, have been differentiated. At the same time, this behavior demonstrates an increased understanding of spatial relationships, in that the obstacle is "in front of" the desired object. This stage marks the beginning of true intentional behavior. The child is now able to apply the schemas he has acquired to various new situations. He is limited at times, however, by his habit of applying a schema which he has previously found successful to new, inappropriate situations. Also important in this stage is the use of signs to anticipate events. The child anticipates getting juice when he sees a certain cup; he cries when his mother goes to the door. These anticipatory responses by the child reveal that he has differentiated between his own actions and outside events which are independent of his actions (Flavell, 1963).

Stage 5: Tertiary circular reactions (12-18 months)

The term "tertiary" as opposed to "secondary" refers to the child's discovery of new "means schemas" to achieve the same end (Flavell, 1963). In discussing tertiary circular reactions, Piaget and Inhelder (1969) use the example of the "behavior pattern of the support." If the child, in trying to reach the desired object, happens to pull a corner of a rug the object is placed on, he discovers that a relationship exists between the rug and the desired object. He realizes that if he continues to pull the rug, the object will come closer. Thus he has discovered a new means to an end. The tertiary circular reaction, then, marks the beginning of intentional behavior (Piaget, 1952). At this point, however, the intentional behavior occurs as a result of active manipulation of the external environment. It is not until the final stage that the child is able to invent these new means by his own internal representations (Maier, 1965).

At the same time that these tertiary reactions are taking place, the child is beginning to understand more clearly the nature of objects, the relationships of one object to another, and the relationship of an object to his own body (Piaget, 1952).

During stage 5, he is also learning more about himself and the world by imitating others and by his play. It is interesting to note Piaget's distinction between imitation and play: imitation is essentially accommodation; play is essentially assimilation. When a child imitates someone else, he accommodates himself to the schemas of that person; when he plays, he assimilates objects to his existing schemas (Piaget, 1951).

Stage 6: Invention of new means through mental combinations (18-24 months)

In order to understand the significance of Stage 6, it is necessary to remember the means-end behaviors of the two preceding stages. In Stage 4, the child began to apply a familiar schema to new situations. In Stage 5, he began to modify a familiar schema to fit new situations and to discover new means to ends by external manipulation of objects. Now, in Stage 6, he is able to invent new means by an inner exploration that Flavell (1963) called an "internal experimentation." Piaget and Inhelder (1969) refer to Stage 6 as the onset of "sudden comprehension" or "insight." The significant achievement of this stage is the child's ability to invent means to ends by internal representation rather than active exploration as he did in Stage 5. By the process of mental representation, or "symbolic images" (Piaget, 1952), the child is able to represent objects or events he cannot see, and thus act on a situation in an intentional manner and not merely by trial and error. Thus, the acquisition of new means can take place prior to an action. Simply stated, the child is able to think of new solutions to simple problems before acting.

During Stage 6, the child is also developing a clearer understanding of the relationships between objects and himself. Toward the end of this stage, he is ready to use these understandings and his own elementary reasonings to define the world more clearly during the next phase, the Pre-operational Phase.

Piaget's six stages of sensorimotor development provide a sound framework for the development of an ordinal scale for assessing cognitive ability during the first two years of life. The following section will demonstrate how Uzgiris and Hunt constructed their Ordinal Scales of Infant Development based on these stages.

Uzgiris-Hunt Ordinal Scales of Psychological Development

During the six stages of sensorimotor development, as outlined above, various reorganizations of sensorimotor schemas are taking place (Dunst, 1980). Each stage marks the infant's ability to deal with the environment in a superior way (Phillips, 1969). Achievements are occuring in many different branches of behavior.

Uzgiris and Hunt (1975) have organized these branches of behavior into seven domains. Each behavioral domain comprises a separate scale of the Uzgiris-Hunt Ordinal Scales of Psychological Development (1975). Each scale includes behaviors which present themselves during one of Piaget's sensorimotor stages. These behaviors are arranged ordinally from those occurring in Stage 1 those occurring in Stage 6.

Tables 1-7 (modified from a table by Dunst, 1980) present selected characteristics of each of these domains as they occur by sensorimotor stage. The columns on the left list the sensorimotor stages and the ages at which they occur. The columns on the right present the attainments in that particular domain in the order in which they occur.

TABLE 1: SELECTED CHARACTERISTICS OF THE ATTAINMENT OF OBJECT PERMANENCE

	Stages (age in months)	Behaviors
I.	Use of Reflexes (0-1)	No active search for objects vanishing from sight
II.	Primary Circular Reaction (1-4)	Attempts to maintain visual contact with objects moving outside visual field
III.	Secondary Circular Reaction (4-8)	Reinstates visual contact with object; retrieves a partially hidden object
IV.	Coordination of secondary circular Reaction (8-12)	Secures objects <u>seen</u> hidden by a single barrier
V.	Tertiary circular Reaction (12-18)	Secures objects hidden through a series of <u>visible</u> displacements
VI.	Invention of New Means through Mental Combinations (18-24)	Recreates sequence of displacements to secure object (Secures object hidden through a series of <u>invisible</u> displacements)

TABLE 2: SELECTED CHARACTERISTICS OF PURPOSEFUL PROBLEM SOLVING

Stages (age in months)		Behavior
I.	Use of Reflexes (0-1)	Reflexive reactions only to external stimuli
II.	Primary Circular Reaction (1-4)	First acquired adaptions, coordination of two schemas
III.	Secondary Circular Reaction (4-8)	Repeats actions to make interesting sights last
IV.	Coordination of secondary circular Reaction (8-12)	Serializes two heretofore separate behaviors in goal-directed sequences
V.	Tertiary circular Reaction (12-18)	Discovers new means behaviors to obtain desired goal
VI.	Invention of New Means through Mental Combinations (18-24)	Invents means behaviors by internal processes

TABLE 3: SELECTED CHARACTERISTICS OF THE ATTAINMENT OF VOCAL IMITATION

Stages (age in months)		Behaviors
I.	Use of Reflexes (0-1)	Vocal contagion (cries when hears another infant cry)
II.	Primary Circular Reaction (1-4)	Repeats sound just produced following adult imitation of sound
III.	Secondary Circular Reaction (4-8)	Imitates sound already in his/her repertoire
IV.	Coordination of secondary circular Reaction (8-12)	Imitates novel sounds that are similar to sounds in repertoire
V.	Tertiary circular Reaction (12-18)	Imitates novel sound patterns and words not previously heard
VI.	Invention of New Means through Mental Combinations (18-24)	Imitates complex verbalizations; reproduces previously heard sounds and words from memory

TABLE 4: SELECTED CHARACTERISTICS OF THE ATTAINMENT OF GESTURAL IMITATION

Stages (age in months)		Behavior
I.	Use of Relfexes (0-1)	No signs of imitation of movements he/she performs
II.	Primary Circular Reaction (1-4)	Repeats movements just made following adult imitation of the action
III.	Secondary Circular Reaction (4-8)	Imitates simple gestures already in repertoire that are visible to self
IV.	Coordination of secondary circular Reaction (8-12)	Imitates invisible self-movements and novel movements comprised of familiar actions
V.	Tertiary circular Reaction (12-18)	Imitiates novel movements of self that are not visible and not previously performed
VI.	Invention of New Means through Mental Combinations (18-24)	Imitates complex motor movements. Reproduces previously observed actions from memory

TABLE 5: SELECTED CHARACTERISTICS OF THE ATTAINMENT OF CAUSALITY

Stages (age in months)		Behavior
I.	Use of Reflexes (0-1)	No signs of understanding causal relationships
II.	Primary Circular Reaction (1-4)	Shows signs of precausal understanding
III.	Secondary Circular Reaction (4-8)	Uses procedures (e.g., generalized excitement) as a causal action to have an adult repeat an interesting spectacle
IV.	Coordination of secondary circular Reactions (8-12)	Touches adult's hands to have him instigate or continue an interesting game or action
V.	Tertiary circular Reaction (12-18)	Hands object to adult to have him repeat or instigate a desired action
VI.	Invention of New Means through Mental Combinations (18-24)	Shows capacity to infer a cause when given only its effect and to foresee an effect given a cause

TABLE 6: SELECTED CHARACTERISTICS OF THE ATTAINMENT OF SPATIAL RELATIONSHIPS

Stages (age in months)		Behavior
I.	Use of Reflexes (0-1)	No signs of appreciation of spatial relationships between objects
II.	Primary Circular Reaction (1-4)	Reacts to external stimuli as representing independent spatial fields (e.g., visual, auditory)
III.	Secondary Circular Reaction (4-8)	Shows signs of understanding relationships between self and external events
IV.	Coordination of secondary circular Reaction (8-12)	Rotates and examines objects with signs of appreciation of their three-dimensional attributes, size, shape, weight, etc.
V.	Tertiary circular Reaction (12-18)	Combines and relates objects in different spatial configurations
VI.	Invention of New Means through Mental Combinations (18-24)	Manifests ability to "represent" the nature of spatial relationships that exist between objects, and between objects and self

TABLE 7: SELECTED CHARACTERISTICS OF THE ATTAINMENT OF PLAY

Stage (age in months)		Behavior
I.	Use of Reflexes (0-1)	No signs of intentional play behavior
II.	Primary Circular Reaction (1-4)	Produces primary circular reactions repeatedly in an enjoyable manner
III.	Secondary Circular Reaction (4-8)	Repetition of interesting actions applied to familiar objects
IV.	Coordination of secondary circular Reaction (8-12)	During problem solving, abandons end to play with means. Applies appropriate social actions to different objects
V.	Tertiary circular Reaction (12-18)	Adaptive play: begins to use one object as a substitute for another during play
VI.	Invention of New Means through Mental Combinations (18-24)	Symbolic play: uses one object as a "signifier" for another

Piaget (1952) described many situations which he used to evoke the behaviors listed in Tables 1-7. Uzgiris and Hunt (1975) selected from these situations the ones which could easily be reproduced in an indoor setting and administered by an examiner unfamiliar with the child. After several revisions of their original list, they produced their final seven scales. Each of these scales is comprised of items designed to elicit behaviors indicative of level of development in each of the seven domains. Table 8 lists the seven Uzgiris-Hunt Scales and the corresponding behavior domain each assesses.

A sample examination record form is included in the manual (Uzgiris and Hunt, 1975). The record form is divided into seven sections for each scale. Each section lists the items to be presented to the examinee and a suggested number of presentations. Below each item are listed several possible responses. The responses designated by an asterisk and/or italics are called "critical actions." These responses are the ones which must be exhibited in order to receive credit for an item. Each scale is scored by the number corresponding to the highest item passed. (Since these scales are ordinal, all items falling below the highest item passes are credited.)

Uzgiris and Hunt included in their manual, Assessment in Infancy: Ordinal Scales of Psychological Development (1975), a detailed description of the methods they used to develop the scales, the empirical data they collected to support their use, and administration and scoring procedures. However, they did not include any method or structure which could be used to translate

TABLE 8

UZGIRIS-HUNT SCALES AND
CORRESPONDING BEHAVIOR DOMAINS

	Uzgiris-Hunt Scale	Behavior Domain
I.	The Development of Visual Pursuit and the Permanence of Objects	Object Permanence
II.	The Development of Means for Obtaining Desired Environmental Events	Purposeful Problem Solving
III.a.	The Development of Imitation: Vocal	Vocal Imitation
III.b.	The Development of Imitation: Gestural	Gestural Imitation
IV.	The Development of Operational Causality	Causality
V.	The Development of Object Relations in Space	Spatial Relationship
VI.	The Development of Schemes for Relating to Objects	Play

individual scale scores into actual level of stage attainment. This has been done in a manual by Dunst (1980) and will be discussed in Chapter 4.

CHAPTER 2

REVIEW OF THE RESEARCH LITERATURE

Before any new assessment technique can be used with complete confidence, research must be conducted to provide empirical data on its reliability and validity. Reliability concerns the extent to which test results are consistent over time, or between different examiners, or under other variable conditions (Anastasi, 1976). Test-retest reliability and inter-examiner reliability are two types of reliability often used with developmental techniques. Validity studies examine whether the technique actually measures what it is purported to measure and if so, how well (Anastasi, 1976). Construct validity is used as a measure of "what" a test measures; i.e., to what degree the test measures a construct, in this case, cognitive development. In determining construct validity for ordinal scales, empirical data must be provided on the sequential invariance of the successive steps or the test must be correlated with other tests already proven valid (Anastasi, 1976). Predictive validity measures the degree to which a test is able to predict behavior in certain situations. This chapter will review and discuss the current research on reliability, construct validity, and predictive validity of the Uzgiris-Hunt Ordinal Scales.

Uzgiris and Hunt report studies of inter-examiner reliability and test-retest reliability in their manual (1975). Inter-examiner

reliability was determined by calculating agreement or disagreement by two examiners on each eliciting situation presented to 84 normal subjects. Only those situations which had actually been presented were used in the calculation. In this study, Uzgiris and Hunt obtained a mean of the average percentages of agreement for each infant action during two examination sessions of two testings each. Each examination session was conducted by two trained examiners, with one acting as examiner and one as observer. An average percentage was calculated for each infant action. The mean of these averages was 96.1 with a range of 72 to 100%. Eighty-seven percent of the individual actions has an average percentage of agreement of above 90.

Test-retest reliability is referred to by Uzgiris and Hunt (1975) as "inter-session stability." For the study cited in the manual, they calculated the mean of the average percentages in the same manner as described above for inter-examiner reliability. Infant actions that were recorded as present in the first examination and absent in the second were counted as agreements. Actions which were recorded as present in both examinations were counted as agreements. The calculations were made using the same sample as above. The examinations sessions were reported to be 48 hours apart. The mean of the averaged percentages of consistency was 79.9, with a range of 42 to 100 percent. Eighty percent of the actions had an average percentage of consistency above 70. Uzgiris and Hunt explain that the 31 actions with percentages of agreement below 70 involved behaviors in which the infant's and examiner's intentions might not correspond (e.g., imitation) or

where the infant's motivational factors and rapport with the examiner might interfere with responses (e.g., imitations of sounds, search for hidden object).

These studies by Uzgiris and Hunt (1975) demonstrate the reliability of their scales with normal individuals. Other investigators (King and Seegmiller, 1973; Wachs, 1975; Siegel, 1981) have conducted studies with normal subjects which come to silimar conclusions.

King and Seegmiller (1973), in a study using black firstborn male infants as subjects found correlations between Bayley scores and each of the individual scale scores of the Uzgiris-Hunt Scales. However, none of these correlations were above 54.

Wachs (1975) conducted a longitudinal study of 23 infants between the ages of 12 and 24 months. He tested them at 3-month age intervals with the Uzgiris-Hunt Scales and then at 31 months with the Stanford-Binet. All of the Uzgiris-Hunt individual scales were correlated with Stanford-Binet scores at 31 months.

Siegel (1981) correlated Uzgiris-Hunt individual scale scores at 4, 8, 12, and 18 months with Bayley scores at 24 months. She found high correlations between the means, schemas, conceptual ability, and spatial relationship scales of the Uzgiris-Hunt scales and subsequent Bayley scores.

As a test of construct validity, Uzgiris and Hunt (1975) performed a scalogram analysis to determine if the steps within each scale were ordinal. They calculated Green's Index of Consistency for all seven scales. Results indicated that the scales

were indeed ordinal, with Green's Index of Consistency ranging from .80 for the Development of Schemes for Relating to Objects to .99 for the Development of Operational Causality.

While the data from these studies mentioned above support the use of the Uzgiris-Hunt Scales with normal children, their use in assessing profoundly retarded individuals requires that similar data be provided by studies with this population.

The question of whether retarded individuals progress through the same stages of development as normal individuals is a fundamental concept in this type of research. Barbara Inhelder (1943/1968) was the first researcher to suggest that Piaget's theory could be applied to retarded as well as non-retarded persons. The findings of her study of moderate and mildly retarded individuals were extended to include the severely and profoundly retarded in a similar study by Mary Woodward (1959). Both of these researchers concluded that mentally retarded individuals were functioning in one of the stages of Piaget's sensorimotor period and that their development follows the same sequence as Piaget had postulated for normal children.

Recent researchers generally agree that the development of retarded individuals follows the same sequence as that of normal individuals, but at a slower rate (Stephens, 1974; Silverstein, Brownlee, Hubbell, and McClain, 1975; Kahn, 1976; Rogers, 1977).

However, there have been very few studies conducted investigating the reliability and validity of the Uzgiris-Hunt Scales with profoundly retarded individuals. Of the studies conducted (Silverstein et al, 1975; Kahn, 1976; Wachs and de Remer, 1978;

Barenbaum, 1980; Dunst, Reingrover, and Kistler, in press), most have correlated individual scale scores with scores from other instruments. All of these studies have combined different levels of mental retardation or have mixed retarded and non-retarded subjects. Some have looked at only one age group, i.e., only infants or only adult subjects.

Silverstein, Brownlee, Hubbell, and McLain (1975) found high scoring reliability for the object permanence and spatial relationship scales in a study with 64 severely and profoundly retarded children. They calculated a percentage of agreement as well as a phi coefficient between examiner and observer scores. In addition, they calculated Pearson product-moment correlations between corresponding total scores. All correlations were in the high 90's.

Kahn (1976) assessed 63 severely or profoundly retarded children with all seven scales of the Uzgiris-Hunt Ordinal Scales. Inter-examiner reliability for each of the scales ranged from .78 to .95. Test-retest reliability ranged from .88 to .96. Kahn also performed scalogram analyses for six of the scales. His results indicated that these scales were ordinal with severely and profoundly retarded subjects. Green's Index of Consistency ranged from .81 to 1.00.

Wachs and deRemer (1978) compared the Uzgiris-Hunt Scales with a measure of adaptive behavior, the Alpern-Boll Developmental Profile with a group of severely, moderately, and mildly retarded children below 54 months of age. They obtained significant correlations between adaptive behavior and performance on the object

permanence and foresight scales. They also showed specific correlations between individual scales within the Uzgiris-Hunt and Alpern-Boll Scales.

Another study by Hohnstein and Gill (1979) is important to the research although it did not use the Uzgiris and Hunt Scales as its measure of Piagetian assessment. The authors instead ascertained level of Piagetian assessment by observing behavior during a play session. The subjects used in their study were developmentally delayed, multi-handicapped children between 12 and 67 months of age. The authors found a correlation of .85 between their Piagetian measure and Bayley scores.

Barenbaum (1980) found the Uzgiris-Hunt Scales to be both reliable and valid for assessment of severely and profoundly retarded institutionalized adults, ranging in age from 18 to 60 years. She criticized the Scales for having a marked ceiling effect, in particular, a lack of discrimination at the upper end of the scales. Barenbaum's data suggested that the Scales were not ordinal with this population and she recommended that they be revised in order to offer items which are better ordered and more highly differentiated at the upper end. More research is needed to examine these problems.

Most recently Dunst, Rheingrover, and Kistler (in press) demonstrated validity of the Uzgiris-Hunt Scales in predicting Bayley mental ages with retarded and non-retarded subjects from 0 to 48 months of age. Using an EDA (Estimated Developmental Age) and SA (Sensorimotor Age) as previously outlined by Dunst (1980), they were able to demonstrate a significant relationship between

these scores and Bayley mental ages. The highest correlation was .80 and was between SA scores and Bayley mental ages. They were also able to predict Bayley Mental Ages from Uzgiris-Hunt SA's. Their regression equation was: MA = .32 + 1.14 SA, with SA underestimating MA by approximately 1.5 months. The authors also report a median percentage of agreement of 92 for the Uzgiris-Hunt scale and 95 for the Bayley.

Although the studies cited above indicate that Piagetian scales are applicable to the profoundly mentally retarded and that the Uzgiris-Hunt Scales are reliable and valid with this population, no studies have been conducted which correlate total scores on the Uzgiris-Hunt with total scores on another instrument. Also, none of the studies conducted so far have limited subjects to only profoundly retarded individuals or have included profoundly retarded individuals of all ages.

Barenbaum (1980) cautions against the extrapolation of data from such studies to different populations. She stresses the importance of population identification to study results.

For these reasons, the present study, discussed in the following chapter, was conducted. It provides additional empirical evidence of the reliability and validity of the Uzgiris-Hunt Scales with this population. It compares the Uzgiris-Hunt Scales with the Bayley (1969) using total scores for each scale, thus correlating the Uzgiris-Hunt instrument in its entirety with the Bayley Mental Scale. This study limits its subjects to profoundly retarded, physically handicapped individuals.

CHAPTER 3

THE STUDY

Methods

Subjects

The subjects chosen for this study were 24 profoundly mentally retarded, physically handicapped residents of a state institution for the developmentally disabled. All 24 were non-verbal and non-ambulatory. The sample was predominantly white (83%) with 58% male and 42% female subjects. The age range was 9 years to 39 years, with a mean age of 22. Selected characteristics of the sample are presented in Table 9.

The policy of this particular facility requires that each resident be administered an AAMD Adaptive Behavior Scale (Nihira, Foster, Shellhaas, and Leland, 1975) yearly and a standardized intelligence test, usually the Bayley (1969), every three years. These test results are presented by the psychologist to the other interdisciplinary team members at the resident's annual staffing. Beginning December 1, 1981, those residents requiring the complete psychological evaluation, including both the ABS and the Bayley, were selected as subjects as they came up for their annual staffings. Those residents diagnosed as blind were excluded from the study. Both tests used in this study, the Bayley (1969) and the Uzgiris-Hunt Ordinal Scales of Psychological

TABLE 9

SELECTED CHARACTERISTICS OF THE SAMPLE (N=24)

Characteristics	Number in sample	Percentage
Mean Age in years - 22.29 (standard deviation 8.33)	24	-
Sex Distribution:		
Male	14	58%
Female	10	42%
Racial Distribution:		
White	20	83%
Black	4	17%
Seizure Disorders	19	79%
Spastic Quadriplegia	12	50%
Hydrocephaly	2	8%
Microcephaly	5	21%
Behavior Disorders	3	13%

Development (1975), require some visual ability and are not appropriate for use with blind individuals.

Instruments

The instruments used in this study were the Bayley Scales of Psychological Development (1969) and the Uzgiris-Hunt Ordinal Scales of Psychological Development (Uzgiris-Hunt, 1975).

Bayley Scales of Psychological Development

The Bayley Scales of Psychological Development (Bayley, 1969) include a Mental Scale, Motor Scale, and Infant Behavior Record. Only the results of the Mental Scale were used in this study.

Items on the Bayley are presented to the subject and are scored as "pass," "fail," or "other." Items are presented until the subject fails ten consecutive items. The age placement corresponding to the highest item passed before these ten failures is called the "ceiling age." A raw score is tabulated by adding the number of items passed. All items falling below the basal age, that age placement corresponding to the item below which all items are passed, are credited as passes.

Uzgiris-Hunt Ordinal Scales of Psychological Development

The Uzgiris-Hunt Ordinal Scales of Psychological Development (Uzgiris and Hunt, 1975) consists of seven separate subscales: The Development of Visual Pursuit and the Permanance of Objects, The Development of Means for Obtaining Desired Environmental Events, The Development of Vocal Imitation, The Development of

Gestural Imitation, The Development of Operational Causality, The Construction of Object Relations in Space, and The Development of Schemes for Relating to Objects. Beginning with the first item, each item is presented to the subject until he fails one. After this, 2 or 3 of the subsequent items are presented. Each item is presented a recommended number of times. Several possible responses are listed below each item. Only those responses marked with an asterisk or italicized are counted as passes. These responses are called "critical actions." An individual score is obtained for each scale by noting the highest item passed.

Procedure

All 24 subjects were administered the Bayley (1969), the Uzgiris-Hunt Ordinal Scales (1975), and the AAMD Adaptive Behavior Scale (Nihira, Foster, Shellhaas, and Leland, 1975) in preparation for their annual staffings. The Bayley (1969) and the Uzgiris-Hunt Ordinal Scales (1975) were administered by two different examiners to prevent score contamination. The examiners were unaware of the resident's score on the other test. The order in which the tests were given was counterbalanced to control for any influence one test might have on the other. Twelve subjects were given a Bayley first and the other twelve were given the Uzgiris-Hunt Scales first. The mean interval between administration of the two tests to a subject was 25.33 days with a range of 3 to 60 days. Both tests were administered and scored according to instructions in the manuals. For the purposes of this study, a total raw score was obtained for the Uzgiris-Hunt Scales by

adding up the individual scale scores. Using this raw score and the raw score of the Bayley, a Pearson product-moment correlation was computed. A regression equation was then computed to predict Bayley raw scores from Uzgiris-Hunt total raw scores.

A third examiner was used to provide data for inter-examiner reliability of the Uzgiris-Hunt Scales. This examiner and one of the original examiners each tested the final 10 subjects within a 24-hour period. Neither examiner was aware of any previous results and the order of testing was counterbalanced between examiners. A mean percentage of agreement was computed from the percentages of agreement on each of the items. Only those items actually administered by both examiners were included in the calculations. Next, a Pearson product-moment correlation was computed using each examiner's total raw scores.

Results

The Uzgiris-Hunt Ordinal Scales of Psychological Development (1975) and the Bayley Scales of Infant Development are highly correlated in this sample of profoundly retarded, physically handicapped individuals. A Pearson product-moment coefficient of .90 ($p < .001$) was obtained between total raw scores on each scale. Table 10 lists both scores for each subject.

Results indicated that Bayley Mental Scale raw scores can be predicted from total Uzgiris-Hunt scores. The predictive equation was calculated to be $x = 15.85 + 1.98y$, where x is the Bayley raw score and y is the Uzgiris-Hunt total score. Figure 1 shows the line of best fit for the correlation between these two scales.

TABLE 10

Corresponding Bayley and Uzgiris-Hunt Scores of Sample

Subject No.	Bayley Score	Uzgiris-Hunt Total Score
1	10	0
2	28	14
3	34	5
4	65	17
5	59	23
6	17	0
7	20	1
8	93	43
9	69	25
10	27	0
11	36	4
12	49	9
13	16	7
14	9	1
15	10	0
16	78	22
17	45	19
18	43	13
19	34	9
20	19	3
21	50	20
22	11	1
23	18	10
24	36	5

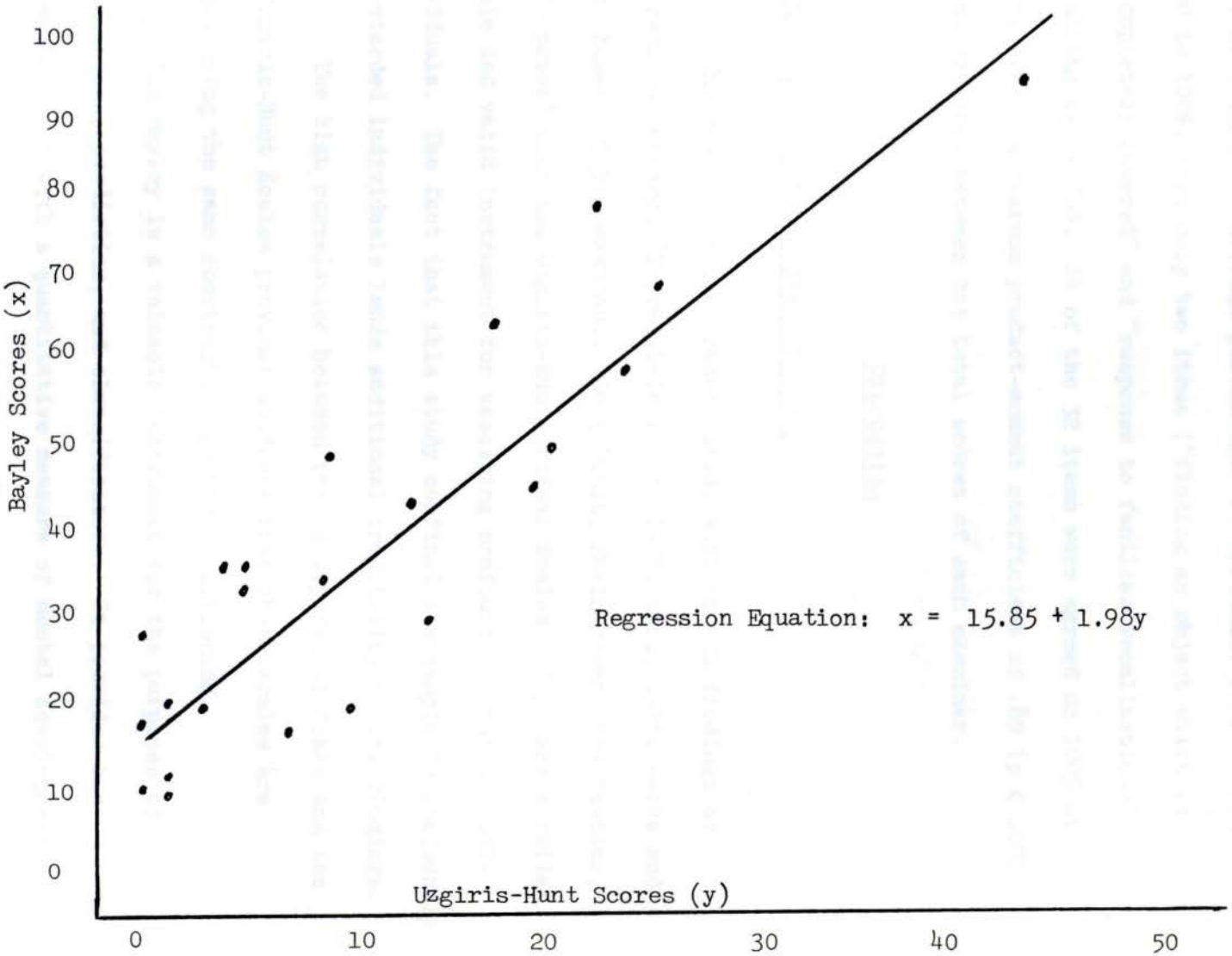

Figure 1: Line of best fit for the correlation between Uzgiris-Hunt total scores and Bayley raw scores

Inter-examiner reliability was high. The mean percentage of agreement computed from the average percentages of agreement for each item administered by both examiners was 85.9%. From a total of 32 items, the average percentages of agreement ranged from 50 to 100%, with only two items ("finding an object which is completely covered" and "response to familiar vocalizations") falling below 70%. 14 of the 32 items were agreed on 100% of the time. A Pearson product-moment coefficient of .89 ($p < .001$) was obtained between the total scores of each examiner.

Discussion

Implications of the present study

The results of the present study support the findings of previous research (Silverstein et al, 1975; Kahn, 1976; Wachs and de Remer, 1978; Barenbaum, 1980; Dunst, Rheingrover, and Kistler, in press) that the Uzgiris-Hunt Ordinal Scales (1975) are a reliable and valid instrument for assessing profoundly retarded individuals. The fact that this study confined its sample to profoundly retarded individuals lends additional credibility to its findings.

The high correlation between the Bayley Mental Scale and the Uzgiris-Hunt Scales provides evidence that these scales are measuring the same construct, cognitive functioning.

The Bayley is a valuable instrument for the purposes of selection, prediction, and classification. It provides the psychologist with a quantitative measure of mental development. However, for the purpose of therapeutic intervention, the Uzgiris-Hunt Scales appear to be a more useful instrument, at least with

this particular population. The individual scale scores of the Uzgiris-Hunt Scales indicate an individual's development across many different domains of cognitive development. They provide the psychologist with an evaluation of an individual's strengths and weaknesses and thus can be used in deciding what type of intervention would be best for that individual.

Limitations

One of the limitations of this study was its lack of an investigation of the stability of Uzgiris-Hunt assessments over time. Although there has been some research in this area, (see Dunst and Rheingrover, 1981, for a review), it is very limited. This study could have added to the literature by including such empirical data.

A second limitation was time. Inter-examiner agreements would have been higher had both examiners spent equal amounts of time observing the subjects during periods other than the testing situation.

The examiners were also limited in their knowledge of the problems inherent in physical deformities such as spastic quadriplegia. Although the Uzgiris-Hunt Scales allow for a more flexible choice of stimulus objects than the Bayley, it still seems that assessments would be more accurate if examiners better understood the problems involved in testing individuals with physical deformities.

Implications for Future Studies

More research is needed to demonstrate the stability of Uzgiris-Hunt Scale assessments over time, the use of primary and secondary reinforcers in assessment and intervention, and the role of object preference as it influences both test results and treatment.

Studies investigating different types of intervention are needed, with emphasis on what types of programming provide results that last over time. Another avenue to explore is how to train and motivate staff directly involved with these residents to provide continuous, on-going interaction which is stimulating and positive.

CHAPTER 4

CLINICAL USE OF THE UZGIRIS-HUNT SCALES

Five years after Uzgiris and Hunt published their manual, Carl Dunst (1980) authored A Clinical and Education Manual for Use with the Uzgiris and Hunt Ordinal Scales. His work is the most comprehensive examination of Uzgiris and Hunt's Scales in print and is particularly useful in the area of clinical analysis and intervention. He has done an excellent job not only of describing the Uzgiris and Hunt instrument, but in providing a structure into which the critical actions can be fitted to ascertain level of stage development in each of the domains.

In his manual, Dunst (1980) has designed clinical record forms which lend themselves to educational programming more readily than those provided by Uzgiris and Hunt (1975). Each scale has its own record form which lists scale steps and the corresponding "critical behaviors" which must be elicited in order for the examinee to pass that particular item. Some of these critical behaviors correspond to Uzgiris and Hunt's "critical actions" and are noted on the record form by "critical action codes." Other of the critical behaviors are "Experimental" (E) and are included by Dunst as additional measures to provide more diagnostic information. Dunst makes the point that because handicapped and retarded infants take longer to progress through the sensorimotor period, many more intermediate steps or levels can often be identified in

particular developmental areas. Thus the addition of his (E) items. He also includes a cover page or "Summary Record Form" for recording demographic data, and a chart for recording the highest attainment in each scale, the summary scores, and other pertinent data.

The most valuable form for the purposes of intervention is the "Profile of Abilities Form." All of the critical behaviors and experimental behaviors included on his examination record forms are plotted according to sensorimotor domain and stages of development. Each individual's score can be fitted into this profile graphically to show his strengths and weaknesses, as well as overall stage attainment.

Since the "scale steps" mentioned above do not correspond one-to-one with the Uzgiris-Hunt Scale items, it was necessary to revise Dunst's Profile of Abilities Form in order to use it with the individuals we tested. This was done by translating the scale steps of Dunst's Record Forms into the corresponding critical action item numbers on the Uzgiris-Hunt Examination Record Forms. The resulting Profile of Abilities Form (See Figure 2) can be used with individuals tested with the original Uzgiris-Hunt Scales.

PROFILE OF ABILITIES Name: _____ Total Score: _____	Scale I	Scale II	Scale IIIa	Scale IIIb	Scale IV	Scale V	Scale VI
Stage 6: Representation & Foresight (18-24)	13c 15c 12c 14d 11c 14c	12d 11e	6e	4e	7f	11c	j
Stage 5: Tertiary Circular Reactions (12-18)	8e 10e 7c 10d 6c 9c	9e,9f 12c 8c,8d 11d 7e 10d,e	6d 5f	4d 4c 4b	7e 7d 6d	8c 7e 6d 10c	i h
Stage 4: Coordination of Secondary Circular Reactions (8-12)	4d	6c 5c 4c 6c	5d 4c 6c 3f 5e	3c 2d	7c 6c 5d	6c 5c 4e	g f
Stage 3: Secondary Circular Reactions (4-8)	2d 3c	2d 2c 2b 3c	3e 3d 2f 4b	2c 1c	4c 3c 6b 2c 5c	4c 3d	e d (4,5) d (1,2,3)
Stage 2: Primary Circular Reactions (1-4)	2c 1d	1b	2e 2c 3c 1b 2d	2b 1b	1b	2d 1c 1b	c b a
Stage 1: Use of Reflexes (0-1)							
Domains:	Object Permanence	Means-End Abilities	Vocal Imitation	Gestural Imitation	Operational Casuality	Spatial Relationships	Scheme Actions

Figure 2: Profile of Abilities Form* For Use With Uzgiris-Hunt Examination Record Forms

*Modified from a Profile of Abilities form by Dunst, 1980 with permission of the author.

Using this modified Profile of Abilities Form, we can then plot an examinee's results by circling the items he passed and drawing a line connecting the highest items passed in each scale. This procedure will result in a graphic representation of the examinee's individual strengths and weaknesses. At this point we can determine at what level of sensorimotor development he is functioning in each of the behavior domains.

The traditional method of planning an intervention strategy based on this type of structure would be to make the first item failed in each scale a target behavior for programming (Dunst, 1980). Although Dunst (1980) proposes an alternate method, for the purposes of illustrating the use of these profiles, the traditional method will be used here.

The following case study will serve as an example of how to use the Profile of Abilities Form as shown in Figure 2 to plan an intervention package based on Uzgiris-Hunt Scale assessments.

Case Study

James D.

James is a 33-year-old profoundly retarded individual who is non-ambulatory and non-verbal. He enjoys interaction with staff members and can usually be seen lying on his bedcart, looking around the room and smiling at passers-by.

James was administered the Uzgiris-Hunt Ordinal Scales, on which he achieved a total score of 18. The critical actions which he passed were plotted on a Profile of Abilities form (modified from Dunst, 1980). His profile is shown in Figure 3.

PROFILE OF ABILITIES Name: James D. Total Score: 18	Scale I	Scale II	Scale IIIa	Scale IIIb	Scale IV	Scale V	Scale VI**
Stage 6: Representation & Foresight (18-24)	13c 15c 12c 14d 11c 14c	12d 11e	6e	4e	7f	11c	j
Stage 5: Tertiary Circular Reactions (12-18)	8e 10e 7c 10d 6c 9c	9e,9f 12c 8c,8d 11d 7e 10d,e	6d 5f	4d 4c 4b	7e 7d 6d	8c 7e 6d 10c	i h
Stage 4: Coordination of Secondary Circular Reactions (8-12)	4d	6c 5c 4c 6c	5d 4c 6c 3f 5e	3c 2d	7c 6c 5d	6c 5c 4e	g f
Stage 3: Secondary Circular Reactions (4-8)	2d 3c	2d 2c 2b 3c	3e 3d 2f 4b	2c 1c	4c 3c 6b 2c 5c	4c 3d	e d (4,5) d (1,2,3)
Stage 2: Primary Circular Reactions (1-4)	2c 1d	1b	2e 2c 3c 1b 2d	2b 1b	1b	2d 1c 1b	c b a
Stage 1: Use of Reflexes (0-1)							
Domains:	Object Permanence	Means-End Abilities	Vocal Imitation	Gestural Imitation	Operational Casuality	Spatial Relationships	Scheme Actions

Figure 3: Sample Profile of Abilities Form* of Case Study

* Modified from a Profile of Abilities form by Dunst, 1980 with permission of the author.

** Although all items falling below the highest item passed are considered passes, only those behaviors actually exhibited in Scale VI are circled.

James' development was assessed to be predominantly in Stage 2. He did score at the Stage 3 level in "Means-Ends Abilities" (Scale II) and "Gestural Imitation" (Scale IIIb). He also scored at the Stage 4 level in "Schemes for Relating to Objects" (Scale VI). James' profile demonstrates that although he is functioning primarily at Stage 2 (Primary Circular Reactions), he has the potential to function at the Stage 4 level (Coordination of Secondary Circular Reactions).

The intervention package designed for James would include the first item of failure in each of the scales. These would be:

Scale I, Item 2c: Lingers with glance at point of disappearance

Scale II, Item 3c: Repeats arm movements systematically and keeps toy active consistently

Scale IIIa, Item 2d: Vocalizes in response to examiner's infant-like sounds

Scale IIIb, Item 2d: Imitates by gradual approximation

Scale IV, Item 2c: Repeats arm movements systematically and keeps object active consistently

Scale V, Item 4c: Follows object and locates it visually only when it lands in view

Scale VI, Item h: Socially instigates actions (e.g. drinks, wears, drives, builds, hugs, dresses, sniffs, makes walk, etc.)

The decision regarding what types of materials and procedures should be used in implementing James' programs would be made by the psychologist and/or special education teacher. Types and degree of physical handicaps must be considered, as well as individual preferences.

It is not within the scope of this paper to outline complete intervention packages for any individual profile. Even if two individuals had identical profiles, their programs would be quite different because of the unique physical and emotional makeup of each.

Recently much work has been done in several specific areas of intervention. Kahn (1975) has studied the relationship of the sensorimotor stages to the acquisition of language. Morehead and Morehead (1974) give an in-depth analysis of language in terms of Piaget's Sensorimotor Stages. Dunst (1974) has written an intervention manual for early cognitive development which outlines specific remedial activities for particular delays. Brassell and Dunst (1978) and Wohlhueter and Sindberg (1975) have conducted studies of intervention aimed at fostering the development of the object construct. Siefert (1973) has examined possible intervention activities and environmental changes that would provide sensorimotor stimulation for handicapped children. Michaelis (1978) has written an especially insightful discussion of some of the practical human problems involved in communicating with severely and profoundly handicapped individuals.

The method of intervention described in this chapter is aimed at providing a structure for designing programming that can be understood not only by the psychologist, but by all members of the interdisciplinary team. Therapeutic programming with the profoundly retarded cannot be achieved without the support and assistance of all staff involved in the resident's care.

CHAPTER 5

CONCLUSION

The present study along with the previous research provides sufficient evidence for the use of the Uzgiris-Hunt Scales with the profoundly retarded. They can be used alone, or in conjunction with a traditional scale, to provide information on which to base programming.

There are several important points to remember when testing the profoundly retarded. First, it is advisable to administer two or three consecutive items after a first failure. An individual may not be interested in the particular stimulus object being used, may be feeling bad during testing, or may be unable to perform because of physical deformities. We found during our research that at times an individual would fail the first item on a scale and then go on to pass the following two or three items. This was particularly true in the case of the first item on scales II and IV, observation of hand-watching behavior. The same individual could be observed days later engaging in hand-watching behavior. If we had not continued to administer items of those scales, the individual's true abilities would have been grossly underestimated.

Second, it is extremely important to establish a good rapport and to be patient in waiting for a response. Many of these individuals differentially discriminate people. They

will exhibit the desired behavior for their teacher, direct caretaker, foster grandparent, or someone else who is especially close to them, but not for a stranger. Others will respond, but only if they are given sufficient time. One of the children we tested took almost a full ten minutes to move her hand from her side up to a toy to hit it. A long latency to respond is common in this population. Personality variables also enter into any testing situations, but are much more difficult to deal with in this population because of the low level of functioning and lack of communication skills. If our purpose as examiners is to know as accurately as possible what the individual is capable of doing, then we must give him enough time to show us.

Third, the testing session should always be supplemented by periods of direct observation. Uzgiris and Hunt (1975) as well as Woodward (1959) and Inhelder (1943/1968) stress then importance of observation periods to accurate assessment. This point cannot be overemphasized and is an additional plus for Piagetian assessment versus traditional testing. In evaluating the profoundly retarded individual, the examiner should observe behavior during periods of toy play, sensory stimulation, and leisure time, in addition to the testing session.

In the time I have spend preparing this paper, conducting the research, and working with profoundly retarded, multi-handicapped individuals, I have become aware of several things. First, the actual amount of research dealing specifically with this population, in particular their assessment and treatment, is

sadly lacking. Second, there is a need not only for more research, but for more stringent controls in the research that is done. Third, there is a need for more cooperation between the interdisciplinary team professionals and the direct-care staff of institutions if the therapeutic programs are to be effective. Fourth, there is a need for adequate training of all staff involved in the implementation of these programs. And finally, there needs to be more understanding and compassion for the individual resident in order to provide the environmental stimuli necessary to maintain long-lasting effects of intervention.

Our goal of improving cognitive functioning cannot be reached by merely providing accurate assessment and professional programming. A caring staff must provide compassion, understanding, and kindness, and must be adequately trained to meet the needs of these individuals. It has been said that the degree of civilization of a society can be measured by its humanitarian efforts toward the helpless. Hopefully, we will continue to seek knowledge in finding new and better ways to improve the quality of life for the profoundly mentally retarded members of our society.

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