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Development of data base software to facilitate instrument selection in the adapted physical education assessment process

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DEVELOPMENT OF DATA BASE SOFTWARE TO FACILITATE
INSTRUMENT SELECTION IN THE ADAPTED
PHYSICAL EDUCATION ASSESSMENT PROCESS

by

Charles Jay Anema V

A Thesis

Presented to the Faculty of the Graduate School
University of the Pacific
in Partial Fulfillment
of the Requirements for the Degree
Master of Arts in Physical Education

1988

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CHAPTER 1

Introduction

Widespread emphasis has been placed on total physical fitness, pursuit of sport activities and active recreation as worthwhile goals for all members of today's society. Disabled individuals should be no exception. An adapted physical education program for the disabled gives those individuals the same strong base for pursuing various sport and recreational activities in future years, as other individuals in society.

Accurate assessment is a vital part of the adapted physical education process. Used in this process are test instruments to determine eligibility, placement, individualized education programs (IEP's) and checks on a student's progress. A student must perform below a specific standard on a given test to be eligible for adapted physical education. Once eligible, the test determines the level of placement. Each student's IEP can be completely individualized through the assessment process. This means that no two students may have the same program. Finally, through pre and post tests, a check may be made on student progress.

Currently, the assessment procedure poses many problems for professionals in the field. The disparity in population

profiles, and range of assessment instruments are two major problems. Also, there is widespread confusion in the selection, scoring, administration and interpretation of assessment instruments. Few serious attempts to address these problems have occurred to date. This thesis represents such an effort.

Statement of Purpose

The purpose of the study discussed in this thesis was to compile adapted physical education assessment instrument information into a matrix which matches test categories with parameters appropriate to the selection of a specific assessment instrument. From this matrix, a data base software program was developed. Use of the data base software program and thesis will enable the adapted physical educator to select a proper assessment instrument.

Importance of Study

Presently, to find a proper assessment instrument, an adapted physical educator must review numerous materials in order to find the best instrument to use for each individual. Use of the data base software program and thesis would facilitate the search.

According to Bolocan (1986), a data base management system can quickly search through large volumes of data for important information. This system can condense large volumes of records within seconds and retrieve the information.

An adapted physical educator need only profile the individual and parameters involved into the data base software program to select the appropriate instrument. This has pragmatic implications for those responsible for assessments covering diffuse populations and profiles.

Implications of the Study

This thesis and data base software program include assessment instruments commonly used by adapted physical educators, physical therapists, psychologists, special education teachers and physicians. Detailed descriptions of the thirty-three selected assessment instruments are located in the Appendices A through F of this thesis.

Appendix H lists an inventory of assessment instruments to be housed in the School of Education, University of the Pacific. The assessment instruments are to be used by undergraduate students, graduate students and professionals of adapted physical education.

Delimitations of the Study

The following delimitations are relevant to this study:

1. The adapted physical education areas of assessment included reflex tests, motor development tests, physical fitness tests, sensori/perceptual motor tests, motor ability tests, and comprehensive motor performance tests.

2. The Apple-Works data base management program was used.

Definition of Terms

Throughout the study, the following definitions of terms have been used:

Assessment. Assessment refers to the interpretation of the results of measurement for the purpose of making decisions about placement, program planning and performance objectives (Seaman & DePauw, 1982).

Comprehensive Motor Performance Tests. Comprehensive motor performance tests include or span several categories of motor performance. These tests are comprised of motor ability, motor skills, physical fitness, reflex and sensorimotor testing (Seaman & DePauw, 1982).

Motor Ability Tests. Motor ability tests measure the capacity to perform a variety of motor skills involving balance, power, velocity, timing, coordination, agility and the ability to learn a sport skill. May determine motor pattern levels, motor sensory responses and learned skills (Seaman & DePauw, 1982).

Motor Development Tests. Motor development tests measure the emergence of motor responses and motor patterns that develop naturally as a result of physical growth, reflex and sensory system function and interaction of the organism with the environment (Seaman & DePauw, 1982).

Physical Fitness Tests. Physical fitness tests measure physical components such as speed, strength, endurance, flexibility and power (Seaman & DePauw, 1982; Werder &

Kalakian, 1985).

Reflex Tests. Reflex tests determine the individual's reflex patterns, finding out which reflexes diminish and which continue to exist. Measures abnormal reflex behaviors and may identify some kinds of neurological dysfunction (Cratty, 1979).

Sensori/Perceptual Motor Testing. Sensori/perceptual motor testing determines if sensory system functioning contributes or supports efficient movement and its interaction with movement. Measurements also include an analysis of the processing and integrations of all sensory input (Seaman & DePauw, 1982).

Overview

Chapter 1 stresses the importance of finding and using an appropriate assessment instrument in adapted physical education. The development of this thesis and data base software program will expedite appropriate assessment instrument selection.

Chapter 2 is the Review of Related Literature which includes an analysis of each assessment category. Chapter 3 contains methods for the development of the data base software program. It also includes the results (matrix) of the development and an explanation of data base logic. Chapter 4 summarizes results and presents recommendations for future study.

Finally, the appendices include detailed descriptions

of each assessment instrument, a data base software user guide and the assessment instrument list available at the School of Education, University of the Pacific.

CHAPTER 2

Review of Related Literature

This chapter presents a detailed description of each assessment instrument test category. Following the description of each assessment category, there will be a brief list of the assessment instruments included in the data base program. Assessment instrument test categories to be reviewed include: reflex tests, motor development tests, physical fitness tests, sensori/perceptual motor tests, motor ability tests and comprehensive motor performance tests. Assessment instruments were selected on the basis of popularity of use and availability.

Reflex Testing

The earliest movements that can be observed in the infant consist of reflexes, which are involuntary actions or behaviors triggered by various types of external stimuli. These may include light or sound, touch or pressure on a body location or body position (Cratty, 1979; Seaman & DePauw; Keogh & Sugden, 1985). Reflexes are classified in the following ways: (1) those involving the total body and its orientation to gravity; (2) those that are later incorporated into voluntary movements patterns; and (3) those that differentiate between normal and pathological behavior (Cratty, 1979; Keogh & Sugden, 1985).

After an infant is born, it is important to determine whether the nervous system is functioning properly by attempting to elicit the expected reflexes. If the reflex is uneven in strength when elicited on both sides of the body or is too weak or too strong, a neurological dysfunction is usually suspected. According to Cratty (1979), when a normal reflex continues to be evidenced for too long time period, or fails to appear, the examining physician, therapist, or educator will probably suspect a neurological problem. The study of reflexes is made difficult by the variability with which they appear and disappear. The exact interaction of reflexes and emerging voluntary movements is not clearly understood. Thelen (1981) believes this is true because of individual differences in the presence and strength of voluntary movements, and because of a lack of definitive guidelines for the times a reflex will normally appear and disappear.

Once the paths of the reflexes are complete, there is said to be reflex integration, which is a prerequisite to full maturity of the central nervous system (Cratty, 1979; Seaman & DePauw, 1982; Keogh & Sugden, 1985). Reflex inhibition is developmentally sequenced in stages. Consequently, throughout growth, residuals of various reflexes may become evident in motor performance. If these residuals are not fully integrated, performance may be impaired.

Because individuals such as educators, physicians and therapists need to know the interactions of reflex and voluntary movements for evaluation purposes, a number of reflex tests have been developed. Reflex tests include the following: The Milani-Comparetti Motor Development Screening Test, the Sensorimotor Integration Test, and the Bender-Purdue Reflex Test. (Appendix A.)

Motor Development Tests

Motor development tests evaluate where on the motor developmental continuum a child has progressed (Seaman & DePauw, 1982; Weder & Kalakian, 1985; Haskins, 1971; Brigance, 1978). Developmental tasks emerge in a sequential process for most children. The progressive maturation of the nervous system enhances motor development. Johnson and Magrab (1976) also note that this process of maturation entails progressive alterations in the central and peripheral nervous systems.

Motor development is gaining control of body movements rather than perfecting control. These movements include control in relation to environmental conditions and outcomes to be achieved. Keogh (1985) states that movement or motor development follows an order or sequence of progressions of change. Each progression is a series of general achievements leading up to an important specific achievement, i.e.; standing, walking and jumping.

Motor development tests have been developed in a

variety of ways, including successive observations of the single child in longitudinal studies, comparisons across socio-economic and cultural groups, and extensive cinematographic analysis (Keogh & Sugden, 1985). Children demonstrate individual patterns of developmental rates and the times at which they will master a task. According to Powell (1981), one child's timetable for beginning or ending a task may be different from that of another child, but the mastery of any developmental task occurs within an established time period.

Most developmental tests have "landmark achievements" in each progression that highlight the flow of early movement development. An age span in weeks or months for each "landmark achievement" is given to indicate mastery of a task (Keogh & Sugden, 1985; Powell, 1981).

An adapted physical educator, special education teacher, physician or psychologist uses motor development tests to determine the progress or lack of progress a child is making in developmental achievements. Results from a motor development test can be a reference in developing a child's unique capabilities.

Motor development tests include the Bayley Scales of Infant Development, Koontz Child Development Program, Brigance Diagnostic Inventory, Denver Developmental Screening Test, Developmental Profile, and Test of Gross Motor Development. Gross motor or psychomotor development

will only be reviewed on each motor development test.

(Appendix B.)

Physical Fitness Tests

As one reviews current literature, physical fitness tests may cover a large number of parameters. For the purpose of this study, components of physical fitness tests will include strength, speed, cardio-vascular endurance, flexibility and body composition (Seaman & DePauw, 1982; Eckert, 1974; American Association for Health, Physical Education, Recreation and Dance, 1976; AAHPERD, 1984). Psychological and physical structural factors are major determinants of one's physical performance. According to Eckert (1974), psychological aspects include motivation, attitudes, persistence and drive. These psychological aspects are very important in order to insure scoring reliability. Physical structural factors involve variables within each individual, such as height, weight, joint flexibility, cardiovascular system, limb length, and degree of musculature (Eckert, 1974).

The components of physical fitness tests are included in the following:

Strength. Muscular strength, as defined by Pollock, et al (1978), is the force exerted by an individual during a single maximal effort. There are two methods used to measure strength. These include static and dynamic or isotonic. Fleishman (1964) states that static strength is

the exertion of a maximum effort or force for a brief period of time against a fairly immovable object. The most popular static strength test item is the hand-grip test (Eckert, 1974; Fleishman, 1964). Dynamic strength is the ability of the individual to move, lift and support the weight of the body with a complete freedom of movement (Fleishman, 1964).

Endurance. Endurance is the capacity of an individual to sustain movement or effort over a period of time (Eckert, 1974). Two types of endurance are muscular and cardiovascular. Muscular endurance is associated with activities which require the exertion of a fairly high proportion of muscular strength during successive movements (Pollack, 1978). Test items may include push-ups, pull-ups and sit-ups. Cardiovascular endurance is defined as the capacity of the individual to maintain strenuous activity of a number of muscle groups or of the whole body for a prolonged time (Eckert, 1974). This produces an increased change in respiratory and heart rates. When these rates are increased, aerobic mechanisms are challenged.

Speed. The maximal rate at which an individual is able to move one's entire body or parts of one's body over a specified distance is considered speed of movement (Wilmore, 1977). The distance to be traversed is kept within limits which will prevent endurance from becoming a factor.

Flexibility. The degree to which an individual is capable of movement within the range of joint action of a

single joint or a functional combination is called flexibility (Eckert, 1974).

Body Composition. Fatness or leanness may be determined with a body composition analysis. A body composition analysis of the human body may measure those individuals who exercise regularly and those that lead a sedentary life (Eckert, 1974; AAHPERD, 1984; Larson, 1974).

Physical fitness tests to be included are the AAHPERD Youth Fitness Test, Physical Performance Test for California, AAHPERD Fitness Test for Mild Mentally Retarded Persons, Washington State Elementary School Fitness Test, AAHPERD Health Related Fitness Test, Physical Fitness Battery for Mentally Retarded Children, Project Unique, and California Physical and Health Related Fitness Test.

(Appendix C.)

Sensori/Perceptual Motor Tests

The majority of sensori/perceptual motor tests were developed during the 1960's (Fait and Dunn, 1984). At the time, psychologists believed that academic learning disabilities could be remedied through sensori/perceptual motor activities. Physical education programs were incorporating sensori/perceptual motor skill activities to supposedly improve academic skills.

Today, many concepts concerning perceptual motor programs are in question. Two authors (Salvia and Ysseldyke, 1981) refute the basis of above theories by

stating:

There is a tremendous lack of empirical evidence to support the claim that specific perceptual motor training facilitates acquisition of academic skills. Perceptual motor training will improve perceptual motor functioning. There is no support for the use of perceptual motor tests or activities in planning programs designed to facilitate academic learning.

The learning of motor skills is specific. This also applies to perceptual motor movement, since perception is involved in all voluntary movement except reflex action (Fait and Dunn, 1984). Gaining expertise in specific perceptual motor skills apparently is not correlated with outstanding reading and writing.

Sensori/perceptual motor activities involve sensory system functions. Perception is the recognition and interpretation of stimuli received by the brain from the sense organs in the form of nerve impulses (Seaman and DePauw, 1982). Motor development builds on the learning of previous stages and adds another dimension of perception prior to motor response. A motor response is the result of sensory feedback. The child obtains sensory input and interprets it before responding with a movement.

Sensori/perceptual motor activities involve visual, auditory, haptic and/or kinesthetic sensory responses. For visual perception, activities may include visual discrimination, visual figure ground sensation and depth perception. Auditory perception activities include auditory discrimination, auditory figures, directionality of sound

and auditory temporal perception. Finally, kinesthetic activities include the vestibular sense, proprioception, laterality, directionality, body image and body awareness.

Sensori/perceptual motor tests include Benton Visual Retention Test, Assessment Battery for Children, McCarthy Screening Test, Purdue Perceptual Motor Survey, Quick Neurological Screening Test, Visual Motor Integration Test, Developmental Test of Visual Perception, and Bender Visual Motor Gestalt Test. (Appendix D.)

Motor Ability Tests

According to Arnheim and Sinclair (1985), motor ability tests encompass the development of abilities that are essential to movement and the acquisition of motor skills. Motor abilities are acquired throughout one's life, beginning at the prenatal stage and continuing into adulthood.

Werder (1985) states that tests of motor ability are designed to provide comparative information about an individual's general motor capabilities or proficiencies. These tests are designed to be predictive of a motor skill performance. In addition, reasons for administering motor ability tests include: (1) to determine general motor deficiency, (2) to determine motor proficiencies in specific subtest areas, (3) to provide data to meet criteria for placement into an adapted physical education program. and (4) to determine the strengths and weaknesses in motor

ability (Weder & Kalakian, 1985).

Components of motor ability tests may involve balance, speed, coordination, agility and the ability to learn a sport skill (Seaman & DePauw, 1982; Weder & Kalakian, 1985; Arnheim, 1985). Motor pattern levels, motor sensory responses and learned skills may also be determined.

Motor ability tests include the Bruininks Oseretsky Test, Basic Gross Motor Assessment, Basic Motor Ability Test, Six Category Gross Motor Test, and Test of Motor Impairment. (Appendix E.)

Comprehensive Motor Performance Tests

Comprehensive motor performance tests include several categories of motor performance testing (Seaman and DePauw, 1982). Each comprehensive motor performance test is made up of at least one component from three motor performance categories which may include reflex testing, motor development testing, physical fitness testing, motor ability testing or sensori/perceptual motor testing. This category is fairly new and current literature is quite limited. In order to find out more information about a certain testing component one may refer back to one of the prior mentioned assessment categories.

Comprehensive motor performance tests are used for obtaining several aspects of motor performance (Seaman and DePauw, 1982). Instead of administering a number of assessments, only one comprehensive motor performance test

needs to be administered. Comprehensive motor performance tests include the Basic Motor Fitness Test and the Adapted Physical Education Assessment Scale, Elementary Level and Adapted Physical Education Assessment Scale, Secondary Level. (Appendix F.)

CHAPTER 3

Methodology and Results

A description of the study, an explanation of the particular data base program and the methods used for the development of the data base program are presented in this chapter.

Description of the Study

The purpose of the study discussed in this thesis was to compile adapted physical education assessment instrument information into a matrix which matches test categories with parameters appropriate to the selection of a specific assessment instrument. From this matrix, a data base software program was developed. Use of the data base software program and thesis will enable the adapted physical educator to select a proper assessment instrument.

Use of a Data Base Software Program

A data base program enables the user to collect, store and manipulate data by electronic means (Bolocan, 1986). Instead of manually flipping through pages to find a correct assessment instrument, the user can instruct the computer to find relevant information by searching through its electronic data base. The program also allows one to sort through information and report it in various formats.

The Apple-Works data base program consists of

categories, records and entries. For purposes of this study, a category relates to various test options, such as reflex, motor development, physical fitness, sensori/perceptual motor, motor ability and comprehensive motor performance. A record offers information about a specific assessment instrument. This information includes such things as descriptors, ages of participants, general administration guidelines, test time, and norms. Finally, an entry is a prompt to the computer from the user to retrieve desired categories and/or records.

Type of Data Base Program

For the purpose of this study, the Apple-Works data base management program was used. Apple-Works is a powerful integrated software package that runs in the Apple II family of computers (Bolocan, 1986). This computer was chosen for the study because a majority of school districts now use the Apple II computer. It is a computer with which professionals in the field of adapted physical education are most familiar.

Another important factor in choosing this program was the ease of updating or adding new materials to the data base. One can add current information, delete the old and correct mistakes without changing all the records.

Development of the Data Base

Prior to the development of the data base software program, information was manually sorted and organized. An assessment instrument/parameter matrix was thus developed

according to assessment instruments and the relationship to each particular parameter. Refer to pages 20 through 23 order to review this matrix (Table 1).

The matrix was bisected into assessment instruments and parameters. Assessment instruments were categorized into six divisions according to motor characteristics that they were intended to measure (Seaman & DePauw, 1982). Divisions of assessment instruments remained consistent with definitions in Chapter 1. The divisions include:

- (1) reflex,
- (2) motor development,
- (3) physical fitness,
- (4) sensori/perceptual motor,
- (5) motor ability, and
- (6) comprehensive motor performance.

Parameters were developed by reviewing each individual assessment instrument. The review included assessment instrument manuals and extensive library material research. Parameters were then categorized from each assessment instrument and include such items as strength, speed, age, administration, training, time and norms (Table 1).

From this matrix, the data base software program was established. Some parameters were placed into descriptors according to their sequence on the matrix. Each descriptor includes several parameters. These descriptors had to be developed for proper organization of the data base software program.

The data base software user guide is described in Appendix G. To use this computer program, one should be familiar with the basics of microcomputer operation.

Table 1

ASSESSMENT INSTRUMENT/PARAMETER MATRIX

	PARAMETERS					AGES	TIME	NORMS
	Special Training	Individual Administration	Group Administration	Posture	Gross Motor			
Reflex ¹								
Milani-Comparetti		X	X			0-2 yrs.	8-10 mins.	Normal boys & girls
Sensorimotor Integration Test		X	X			0-21 yrs	8-10 mins.	Developmentally delayed boys/girls
Bender-Purdue Reflex Test		X	X			5-12 yrs	8-10 mins.	Normal boys & girls
Motor Development ²								
Bayley Scales of Infant Development					X X	2-30 mos	45 minutes	Normal boys & girls
Koontz Child Development Program					X X	1-48 mos	20 minutes	Normal
Brigance Diagnostic Inventory	X				X X X	0-7 yrs	30 minutes	Normal
Denver Developmental Screening Test					X X	0-6 yrs	20 minutes	Normal developmentally delayed
Developmental Profile					X X	0-12 yrs	20-40 mins	Normal
Test of Gross Motor Development					X	3-10 yrs	15 minutes	Normal
Physical Fitness ³								
AAHPERD Youth Fitness Test						10-17 ys	2(50m) per.	Normal
Physical Performance Test for Calif.						10-18 ys	3(30m) per.	Normal
AAHPERD Fitness Test for Mildly Mentally Retarded					X	8-18 years	2(30 min.) periods	Mild mentally retarded
Elementary School Physical Fitness						6-12 yrs	50 minutes	Normal
AAHPERD Health Related Fitness						5-18 yrs	60 minutes	Normal
Physical Fitness Battery for Mentally Retarded Children						9-20 years	60 minutes	Educable & trainable retarded
Physical Fitness Testing of Disabled Project Unique					X	10-17 years	2(60 min.) periods	Normal, visual impairments, auditory & orthopedic impairments
Cal. Physical & Health Related Fitness Test						6-18 years	3(30 min.) periods	Normal

TESTS

Reflex¹

- Milani-Comparetti
- Sensorimotor Integration Test
- Bender-Purdue Reflex Test

Motor Development²

- Bayley Scales of Infant Development
- Koontz Child Development Program
- Brigance Diagnostic Inventory
- Denver Developmental Screening Test
- Developmental Profile
- Test of Gross Motor Development

Physical Fitness³

- AAHPERD Youth Fitness Test
- Physical Performance Test for Calif.
- AAHPERD Fitness Test for Mildly Mentally Retarded
- Elementary School Physical Fitness
- AAHPERD Health Related Fitness
- Physical Fitness Battery for Mentally Retarded Children
- Physical Fitness Testing of Disabled Project Unique
- Cal. Physical & Health Related Fitness Test

Table 1 (continued)

ASSESSMENT INSTRUMENT/PARAMETER MATRIX

ASSESSMENT INSTRUMENT	PARAMETERS										TIME	NORMS				
	Body Movements	Body Parts	Body Perception	Laterality	Directionality	Tactile Discrimination	Bilateral Coordination	Rhythm	Fine Motor	Gross Motor			Posture	AGES	Group Administration	Individual Administration
<u>Sensori-Perceptual Motor Test</u> ⁴																
Benton Visual Retention									X		8-15 yrs		X		50 minutes	Normal
Assessment Battery for Children (A-B-C)	X								X		2-12 years			X	45 minutes	Normal & exceptional
McCarthy Screening	X				X	X		X	X		4-6.5 yrs		X		20 minutes	Normal
Purdue Perceptual Motor Survey (PPMS)	X	X	X	X	X	X		X	X		6-10 years			X	45 minutes	Normal
Quick Neurological Screening Test								X	X		6-18 yrs		X		20 minutes	Normal learning disabilities
Developmental Test of Visual Motor Integration								X			2-15 years	X	X		10-15 minutes	Normal
Developmental Test of Visual Perception								X			4-8 years	X	X		45-60 minutes	Normal
Bender Visual Motor Gestalt								X			5-12 yrs		X		12 minutes	Normal
<u>Motor Ability</u> ⁵																
Bruininks - Oseretsky Test of Motor Proficiency	X			X		X		X	X		4.5-14.5 years			X	Long 60 min Short 20 m.	Normal
Basic Gross Motor Assessment	X		X			X	X	X	X		6-12 yrs			X	20 minutes	Normal
Basic Motor Ability Test	X		X			X	X	X	X		4-12 yrs	X	X		20-30 mins.	Normal
Six-Category Gross Motor Test	X		X					X			4-24 yrs		X		30 minutes	Trainable & educable retarded/norm
Test of Motor Impairment								X	X		5-12 yrs		X		60 minutes	Normal
<u>Comprehensive Motor Performance</u> ⁶																
Basic Motor																
Fitness Test							X	X	X		4-18 years	X	X		2 (20 min) periods	Normal, emotionally disturbed, brain damaged, mentally retarded
Adapted Physical Education Assessment Scale	X		X	X	X	X		X	X	X	5-12 years	X	X		20-30 minutes	Normal, various disabilities
Adapted Physical Education Assessment Scale-Secondary Level	X	X		X	X	X		X	X	X	12-16 years	X	X		40 minutes	Normal, various disabilities

Table 1

ASSESSMENT INSTRUMENT/PARAMETER MATRIX

PARAMETERS	PARAMETERS												
	Kinesthetic Awareness	Perception of Spatial Relationships	Perception of Position in Space	Constancy of Shape	Figure Ground	Visual Skills	Eye/Hand Coordination	Eye/Food Coordination	Dynamic Balance	Static Balance	Balance	Speed	
Sensori-Perceptual Motor Test ⁴													
Benton Visual Retention		X	X	X	X	X	X						
Assessment Battery for Children (A-B-C)													
McCarthy Screening													
Purdue Perceptual Motor Survey (PPMS)													
Quick Neurological Screening Test													
Developmental Test of Visual Motor Integration													
Developmental Test of Visual Perception													
Bender Visual Motor Gestalt													
Motor Ability ⁵													
Bruininks-Oseretsky Test of Motor Proficiency	X	X	X	X									
Basic Gross Motor Assessment													
Basic Motor Ability Test	X	X											
Six-Category Gross Motor Test													
Test of Motor Impairment													
Comprehensive Motor Performance ⁶													
Basic Motor													
Fitness Test	X	X	X	X	X	X	X	X	X	X	X	X	X
Adapted Physical Education Assessment Scale	X		X	X	X								
Adapted Physical Education Assessment Scale-Secondary Level	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 1

ASSESSMENT INSTRUMENT/PARAMETER MATRIX

PARAMETER	Kinesthetic Awareness	Perception of Spatial Relationships	Perception of Position in Space	Constancy of Shape	Figure Ground	Visual Skills	Eye/Hand Coordination	Eye/Foot Coordination	Dynamic Balance	Static Balance	Balance	Speed	Explosive Leg Power	Body Composition	Flexibility	Cardio-Respiratory Function	Abdominal/hip Flexor Strength	Leg Strength	Arm/Shoulder Girdle Strength
Reflex ¹																			
Milani-Comparetti																			
Sensorimotor Integration Test																			
Bender-Purdue Reflex Test																			
Motor Development ²																			
Bayley Scales of Infant Development							X	X											
Koontz Child Development Program																			
Brigance Diagnostic Inventory							X	X	X	X	X								X
Denver Developmental Screening Test							X	X	X	X	X								
Developmental Profile							X	X	X	X	X								
Test of Gross Motor Development							X	X	X	X	X								
Physical Fitness ³																			
AAHPERD Youth Fitness Test	X	X	X	X	X							X	X						
Physical Performance Test for Calif.	X	X	X	X	X							X							
AAHPERD Fitness Test for Mildly Mentally Retarded	X	X	X	X	X							X	X						
Elementary School Physical Fitness	X	X	X	X	X							X	X						
AAHPERD Health Related Fitness	X				X	X	X	X											
Physical Fitness Battery for Mentally Retarded Children	X	X	X	X	X							X	X	X	X				
Physical Fitness Testing of Disabled Project Unique	X	X	X	X	X							X	X	X	X				
Cal. Physical & Health Related Fitness Test	X	X			X	X	X	X				X							

CHAPTER 4

Summary and Recommendations

Summary

The purpose of the study discussed in this thesis was to compile adapted physical education assessment instrument information into a matrix which matches test categories with parameters appropriate to the selection of a specific assessment instrument. From this matrix, a data base software program was developed. Use of the data base software program and thesis will enable the adapted physical educator to select a proper assessment instrument.

Two conclusions were drawn, based on the development of the data base software program and thesis. First, a classification scheme can identify appropriate assessment instrument selection. Second, a data base software program facilitates the means of appropriate selection of assessment instruments.

Recommendations

Based on this study, the following recommendations are suggested:

1. Use a data base program that does not review various options (main menu, save files, Memo.1) before getting to the directives.
2. Organize the data base software program to use

fewer directives when seeking an assessment instrument.

3. Continue updating the data base program to include current assessment instruments.
4. Include the detailed descriptions of each individual assessment instrument on the data base software program.
5. Include information regarding purchase of the specific assessment instrument on the data base software program.

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APPENDIX A
Reflex Tests

MILANI-COMPARETTI TEST OF REFLEX DEVELOPMENT

(Trembath, et al., 1977)

Norms:	Boys and girls, 0-24 months, functioning at that age or having residuals of certain reflexes.
Statistical Measures:	Validity and reliability not reported.
Scoring:	Scores expressed in months that reflex should be present, scored graphically on profile sheet.
Equipment:	No specific items except table or other flat, clean surface.
Administration/ Organization:	Individual, 8-10 minutes depending on age of child and experience of examiner, repeat several times during child's first 2 years, specialized training required.

Performance Parameters and Test Items

1. Parachute Reactions: Sideways parachute, backwards parachute, downward parachute, forward parachute.
2. Primitive Reflexes: Foot grasp, hand grasp, symmetric tonic neck reflex, asymmetric tonic neck reflex, Moro reflex.
3. Tilting Reactions: Prone tilting reaction, supine tilting reaction, sitting tilting reaction, all fours tilting reaction, standing tilting reaction.
4. Active Movement: Locomotion, all fours.
5. Righting Reactions: Body lying supine, body pulled up from supine, body held vertically, head in space, body in sagittal plane, body lying prone, body rotative, body derotative.
6. Postural Control: Sitting posture, standing, standing up from supine.

SENSORIMOTOR INTEGRATION TEST FOR
DEVELOPMENTALLY DISABLED CHILDREN

(Montgomery and Richter, 1982)

- Norms: Developmentally delayed boys and girls ages 0-21 years.
- Statistical Measures: Validity and reliability were not reported.
- Scoring: Scoring determined by 3 responses:
(a) abnormal = delayed central nervous system maturation;
(2) normal = adequate central nervous system maturation;
(3) fair = does not meet criteria for normal or abnormal but still delayed.
- Equipment: Table or flat, clean surface.
- Administration/
Organization: Individual, 8-10 minutes depending on age of child, repeat several times until normal responses met, special training required.

Performance Parameters and Test Items

1. Righting Reactions: Neck righting, body righting, prone head righting, supine head righting, lateral head righting.
2. Postural Control: Equilibrium prone, equilibrium sitting.
3. Primitive Reactions: Grasp reflex, avoiding reaction, asymmetrical tonic neck, symmetrical tonic neck, tonic labyrinthine prone, tonic labyrinthine supine.

BENDER-PURDUE REFLEX TEST

(Bender, 1976)

Norms: Boys and girls kindergarten through school age.

Statistical Measures: Validity and reliability not reported.

Scoring: Developmental levels of symmetric tonic neck reflex.

Equipment: Chalk, 2 six inch red targets, large mat or flat, clean surface, low chair or stool.

Administration/
Organization: Individual, 8-10 minutes depending on age and level of reflex development, specialized training required.

Performance Parameters and Test Items

1. Forward Creeping: Creeping posture, head control, arm and hand position, creeping pattern
2. Backward Creeping: Creeping posture, head control, position of trunk, knees, hips, ankles and feet

APPENDIX B
Motor Development Tests

BAYLEY SCALES OF INFANT DEVELOPMENT (BSID)

(Bayley, 1969)

- Norms: Normal boys and girls ages 2-30 months.
- Statistical Measures: Validity scores ranged from 0.46 to 0.66 when compared to Motor Development Inventory (Buros, 1971), test-retest reliability scores ranged from 0.69 to 0.92.
- Scoring: Each test item scored individually (pass/fail), monthly developmental progressions may also be reported by parents.
- Equipment: All items available in kit.
- Administration/
Organization: Individually in 45 minutes, no special training required.

Performance Parameters and Test Items
(Sample of 81)

1. Developmental Gross Motor Skills: Lifts head, turns from side to back, sits alone, early stepping movements, pulls to standing position, stands alone, walks alone, throws ball, walks up stairs with help, jumps off floor, walks on tiptoes, jumps over string. (Many more included.)

KOONTZ CHILD DEVELOPMENT PROGRAM

(Koontz, 1974)

Norms:	Normal boys and girls ages 1-48 months.
Statistical Measures:	Validity not reported, test-retest reliability scores ranged from 0.73 to 0.82.
Scoring:	Each item is scored pass/fail, each developmental task is measured until a failing score is measured, criterion ref.
Equipment:	Tricycle, shoe, pull toy, rubber ball, bottle, scissors, beads, cubes, pencils, paper.
Administration/ Organization:	Individual, depends on level of performance, maximum 20 minutes, no special training.

Performance Parameters and Test Items
(Developmental)

1. Gross Motor: Reflex actions, head movements, raises body when prone, pulls to sitting, rolls over, lifts foot, weight on forearms, weight on hands, head control, crawls backwards, bear weight on one hand, creeping, hand preference, from prone to sitting, pulls to feet, rolls ball, strike object, walks with hand held, walks short distance, overcomes obstacles, walks well, stoops and recovers, hurls objects, kicks ball, walks backwards, jumps/walks on tiptoes, balance on one foot, walks up and down stairs, walks in straight line, catches object, jumps running, balance on one foot for 8 seconds.
2. Fine Motor: Reads with eyes, eyes track, looks and holds, inspects fingers, plays with object, hands together, objects to mouth, transfers objects hand to hand, pulls suspended object, lifts cup, eyes lead, hand preference begins, thumb opposition, bangs object on table, secures pellet, pincer grasp, removes objects, holds bottle, bangs 2 cubes to midline, puts objects in container, marks with pencil, pulls and replaces peg, tower of 2 cubes, puts beads in box, turns pages of book, unwraps edible foods, folds paper, imitates verticle line, turns door knob, loosens laces, strings four beads, cuts with scissors, sorts by color, traces diamond, laces shoes.

BRIGANCE DIAGNOSTIC INVENTORY OF EARLY DEVELOPMENT

(Brigance, 1978)

- Norms: Boys and girls, birth to seven years old.
- Statistical Measures: Validity and reliability coefficients were not reported.
- Scoring: Assessment methods used are parent interview and observation of child's performance, criterion-referenced, based upon the performance of the child in terms of items passed, the "developmental level" is established. Evaluation ends when child has three consecutive failures in one area.
- Equipment: Flat table, small doll, yardstick, stairs, ladder, jump rope, 8" rubber ball, balance board, tricycle, squeaking toy, small blocks, simple puzzle, pencil, paper, scissors, clay.
- Administration/ Organization: Individually, parent input, amount of time depends on skill development of child (maximum 30 minutes each section), no special training.

Performance Parameters and Test Items

1. Pre-Ambulatory Motor Skills: Supine position, prone position, sitting position, standing position.
2. Gross Motor Skills: Standing, walking, climbing, running, jumping, hopping, kicking, balancing, catching, rolling and throwing, ball bouncing, and rhythm.
3. Fine Motor Skills: Eye/finger manipulative skills, block tower building, pre-handwriting, puzzles, draw a person, designs, cutting with scissors, painting with brush, clay.
4. Self-Help Skills: Feeding, dressing, undressing, fastening, unfastening, toileting, bathing, grooming, household chores.

DENVER DEVELOPMENTAL SCREENING TEST

(Frankenburg and Dodds, 1970)

Norms:	Normal and developmentally impaired boys and girls, birth to six years.
Statistical Measures:	A validity score of 0.97 was obtained when compared to the Revised Yale Development Schedule, test-retest reliability scores ranged from 0.66 to 0.99 (Frankenburg, 1971).
Scoring:	Tasks are scored pass/fail with some input from parent, each test item correlates with the ages at which 10, 25, 50, 75 and 90 percent of standardization population could perform.
Equipment:	Red wool, raisins, rattle with narrow handle, eight small cubes (red, yellow, blue, green), small bottle, small ball, pictures of familiar items or objects.
Administration/Organization:	Individual, 20 minutes but depends on age and number of items passed, professionals and paraprofessionals can administer with high accuracy (Powell, 1981).

Performance Parameters and Test Items
(Samples of 105)

1. Personal/Social: Smiles, feeds self, plays pat-a-cake, plays with ball, drinks from cup, removes garment, washes and dries hands, plays interactive games, buttons up, dresses without supervision.
2. Fine Motor Skills: Eyes follow past midline, hands together, grasps rattle, reaches for object, sits and takes 2 cubes, neat pincer grasp of raisin, towers of cubes, imitates bridge, picks longer line.
3. Language: Responds to ball, laughs, squeals, turns to voice, imitates speech sounds, dada or mama specific, combines 2 different words, points to one named body part, names one picture, uses plurals, recognizes colors, defines words.
4. Gross Motor: Lifts head, rolls over, pull to sit, sits without support, pulls self to stand, walks holding on furniture, stands alone, walks well, walks up steps, kicks ball forward, throws ball, jumps in place, balance on one foot, hops on one foot, catches bounced ball.

DEVELOPMENTAL PROFILE

(Alpern and Boll, 1978)

- Norms: Normal boys and girls from birth to 12 years of age.
- Statistical Measures: Validity index averaged 0.84, test-retest reliability coefficients ranged from 0.71 to 0.89.
- Scoring: Developmental items are recorded pass/fail, section that measures "all passed" equals basal level or age norm.
- Equipment: Manual, scoring sheets, candy, tricycle, stairs, scissors, 8" rubber ball, jump rope, key and lock, clay, tennis ball.
- Administration/ Organization: Individually, 20 to 40 minutes, no special training.

Physical Developmental Age Scale

- 0-6 Months: Hold head up, rolls on side, creeping, crawling.
- 7-12 Months: Thumb to pick up objects, from sitting to standing position, stopped drooling.
- 13-18 Months: Walks up stairs, walks without falling, takes paper off candy.
- 19-24 Months: Throws objects at least three feet, up stairs one step at a time, rides tricycle.
- 25-30 Months: Copies lines, jumps without falling, leaps with two feet.
- 31-36 Months: Uses scissors, hops on one foot.
- 37-42 Months: Throws a ball five feet, opens door, cuts out printed circle.
- 43-54 Months: Catches ball, hops ten feet, jumps rope twice.
- 55-66 Months: Key to open lock, makes a clay ball, plays skilled game (hopscotch).
- 67-78 Months: Rollerskates, cuts out picture of animal, skips rope five times.
- 79-90 Months: Carries chair, plays tag, catches a tennis ball.
- 91-102 Months: Strikes and lights a match, winks in either eye.
- 103-114 Months: Whistles a tune, competes in sports, rides a bicycle in traffic.

TEST OF GROSS MOTOR DEVELOPMENT

(Ulrich, 1985)

Norms:	Normal boys and girls ages 3-10 years
Statistical Measures:	Construct validity equaled 75%, test--retest reliability scores measured 0.96, standard error of measurement was 3.0
Scoring:	Provides four different scores: raw scores, percentiles, subtest standard scores and gross motor development quotients
Equipment:	Record book, marking device, lightweight ball, plastic bat, 8" rubber ball, 6" sponge ball and tennis ball
Administration/ Organization:	Individual average of 15 minutes, depends on age of subject and ability of test administrator

Performance Parameters and Test Items

1. Locomotive Skills--Run, Gallop, Hop, Leap, Horizontal Jump, Skip, Slide
2. Object Control Skills--Two Hand Strike, Stationary Bounce, Catch, Kick, Overhand Throw

APPENDIX C
Physical Fitness Tests

AAHPERD YOUTH FITNESS TEST

(AAHPERD, 1975)

Norms: Boys and girls, ages 10 to 17, normal children.

Statistical Measures: Reliability and validity not reported.

Scoring: Percentile score tables based on age.

Equipment: Marked track, horizontal bar, tape measure, stopwatch, mats, two small wooden blocks.

Administration/Organization: Administered individually or in a group, two days or periods, no special training.

Performance Parameters and Test Items

- 1a. Pull-Up: Arm and shoulder strength.
- 1b. Flexed Arm Hang: Arm and shoulder strength, for girls and boys not capable of performing a pull-up.
2. Sit-Up: Abdominal and hip flexor strength and muscular endurance.
3. Shuttle Run: Speed and change of body position.
4. Standing Broad Jump: Explosive muscular strength of leg extensors.
5. Fifty Yard Dash: Speed of total body movement.
6. 600 Yard Run/Walk: Cardiovascular efficiency and endurance.

AAHPERD FITNESS TEST FOR MILDLY MENTALLY RETARDED

(AAHPERD, 1976)

Norms:	Mildly mentally retarded boys and girls, ages eight to eighteen.
Statistical Measures:	Reliability above 0.90 (Rarick, 1976). Validity not reported.
Scoring:	Scores transferred to percentile tables based on age.
Equipment:	Horizontal bar, stopwatches, mats, small blocks of wood, tape measure, softball and marked running area.
Administration/ Organization:	Group or individual, two thirty-minute periods, no special training.

Performance Parameters and Test Items

1. Flexed Arm Hang: Arm and shoulder strength.
2. Sit-Up: Abdominal and hip flexor strength and muscular endurance.
3. Shuttle Run: Speed and change of body position.
4. Standing Broad Jump: Explosive muscular strength of leg extensors.
5. Fifty Yard Dash: Speed of total body movement.
6. Softball Throw for Distance: Arm and shoulder power.
7. 300 Yard Run/Walk: Cardiovascular efficiency and endurance.

ELEMENTARY SCHOOL PHYSICAL FITNESS TEST

(Washington State Department of Instruction, 1965)

Norms:	Normal boys and girls, ages 6 to 12.
Statistical Measures:	Reliability scores ranged from 0.76 to 0.84. Validity is 0.81 when measured with the AAHPERD Youth Fitness Test.
Scoring:	Final scores determined by adding points of each test item.
Equipment:	Benches, mats, stopwatches, measuring tape, adhesive tape and running area.
Administration/ Organization:	Group or individual, can be given over one period, no special training.

Performance Parameters and Test Items

1. Standing Broad Jump: Explosive muscular strength of leg extensors.
2. Bench Push-Ups: Upper body and arm strength and muscular endurance.
3. Abdominal Curl-Ups: Strength and muscular endurance of trunk flexor muscles.
4. Squat Jumps: Strength and endurance of the trunk and leg extension muscles.
5. Thirty Yard Dash: Speed of total body movement.

AAHPERD HEALTH RELATED FITNESS TEST

(AAHPERD, 1980)

- Norms: Normal boys and girls, ages 5 to 18.
- Statistical Measures: Test-retest reliability coefficients ranged from 0.38 to 0.94. Scores of validity ranged from 0.70 to 0.90 (AAHPERD, 1980, Larson, 1974).
- Reliability (sit up = 0.68-0.94; sit and reach = 0.70 and above; skinfold = 0.95 with experienced testers). Validity (sit and reach = 0.80-0.90 with other flexibility tests; skinfold = 0.70-0.90 with hydrostatic weighing).
- Scoring: Scores transferred to percentile tables based on age.
- Equipment: Stopwatches, marked running area, Harpenden or Lange skinfold calipers, mats and a flexibility measuring box.
- Administration/Organization: Can be given individually or in a group, one sixty-minute period, no special training.

Performance Parameters and Test Items

1. (a) and (b) One Mile Run/Nine Minute Run: Cardiorespiratory function, capacity and endurance of the cardiorespiratory system.
2. Sum of Skinfold Fat: Fatness levels, body composition.
3. Modified Sit-Ups: Abdominal muscular strength and endurance.
4. Sit and Reach: Flexibility of the low back and hamstrings.

PHYSICAL FITNESS BATTERY FOR MENTALLY RETARDED CHILDREN

(Fait, 1978).

Norms:	Educable and high trainable mentally retarded boys and girls, ages 9 to 20 years.
Statistical Measures:	Reliability and validity scores not reported.
Scoring:	Raw scores converted to tables measuring low, average and good.
Equipment:	Stopwatches, horizontal bar, mats, and marked running area.
Administration/ Organization:	Group or individual, one sixty-minute period, no special training needed.

Performance Parameters and Test Items

1. Twenty-Five Yard Run: Speed of total body movement.
2. Bent Arm Hang: Static muscular endurance of the arm and shoulder girdle.
3. Leg Lift: Dynamic muscular endurance of the flexor muscles of the leg and of the abdominal muscles.
4. Static Balance Test: Ability to maintain balance in a stationary position.
5. Thrusts: Strength and endurance of the trunk and leg extension muscles.
6. 300 Yard Run/Walk: Cardiorespiratory functions and endurance.

PHYSICAL FITNESS TESTING OF THE DISABLED: PROJECT UNIQUE

(Winnick and Short, 1985)

Norms:	Normal individuals (no physical impairment or disability), visual impairments, auditory impairments and orthopedic impairments (amputations, congenital anomalies, cerebral palsy and spinal neuromuscular conditions), boys and girls, ages 10 to 17 year.
Statistical Measures:	Validity = 0.40 to 0.75 (wide range because many test items modified). Reliability scores not reported.
Scoring:	Scores converted to percentile tables based on age.
Equipment:	Lange or Harpenden Skinfold Calipers, Smedley-type grip dynamometer, stopwatch, mats, regulation softball, tape measure, horizontal bar, flexibility measuring box and a marked running track.
Administration/ Organization:	Two testing periods (60 minutes), prepare to modify and record modifications on each test item, no special training, group or individual.

Performance Parameters and Test Items

1. Skinfold Measures: Body composition, lean body mass and fat.
2. Grip Strength: Strength of hand and forearm.
3. 50 Yard Dash: Speed of total body movement.
4. Sit-Ups: Abdominal and hip flexor strength and muscular endurance.
5. Softball Throw: Arm and shoulder power.
6. Standing Body Jump: Explosive muscular strength of leg extensors.
7. Flexed Arm Hang: Static muscular endurance of the arm and shoulder girdle.
8. Sit and Reach: Flexibility of the low back and hamstrings.
9. One Mile Run/Nine Minute Run: Cardiorespiratory function, capacity and endurance of the cardiorespiratory system.

PHYSICAL PERFORMANCE TEST FOR CALIFORNIA

(California State Department of Education, 1982)

Norms:	Normal boys and girls, ages 10 to 18.
Statistical Measures:	Reliability and validity not reported.
Scoring:	Scores transferred to percentile tables based on age.
Equipment:	Mats, ten-foot measuring tape, stop-watches, benches, horizontal chinning bar, and accurately measured track.
Administration/ Organization:	Two test items completed per day, no special training to administer test.

Performance Parameters and Test Items

1. Standing Long Jump: Explosive muscular strength of leg extensors.
2. Knee Bent Sit-Up: Abdominal strength and muscular endurance.
3. Side Step: Total body speed and coordination.
4. Chair Push-Up: Upper body and arm strength and muscular endurance.
- 5a. Pull-Up: Arm and shoulder strength.
- 5b. Flexed Arm Hang: Arm and shoulder strength, for boys and girls not capable of performing a pull-up.
6. 600 Yard Run/Walk: Cardiorespiratory efficiency and endurance.

CALIFORNIA PHYSICAL AND HEALTH RELATED FITNESS TEST

(California State Department of Education, 1986)

Norms: Normal boys and girls, ages 10-18

Statistical Measures: Reliability and validity not reported

Scoring: Scores transferred to percentile tables based on age

Equipment: Mats, stopwatches, horizontal chinning bar, accurately measured track, skin calipers and a sit and reach box

Administration/ Organization: Two test items completed per day (50 minutes), 4 days, no special training to administer test

Test Items and Performance Parameter

1. Sit and Reach: Flexibility of the lower back and hamstrings
2. 1 Mile Run: Cardiorespiratory function, capacity and endurance of the cardiorespiratory system
3. Pull Ups: Arm and shoulder strength
4. Skinfold Measurement: Fatness levels, body composition
5. Shuttle Run: Speed and change of body position
6. Modified Sit Ups: Abdominal muscular strength and endurance

APPENDIX D
Sensory/Perceptual Motor Tests

BENTON VISUAL RETENTION TEST

(Benton, 1963)

Norms: Boys and girls, ages 8 to 15 years.

Statistical Measures: Validity not reported. Test/retest reliability equals 0.95.

Scoring: Each item scored pass/fail (1 to 0), total score may equal the following: defective, borderline, dull average, low average, average, high average, superior (IQ Equivalents).

Equipment: Test protocols, manual, pencils, paper.

Administration/
Organization: Individually, maximum of five minutes for each drawing form (up to 50 minutes), no special training.

Items to be Drawn

Parallelogram, hexagon, circles and squares, square-circle-triangle, circle-triangle-wave, lines within circles, lines within triangles and square, small triangle and large square, small square and large square, large square and small circle.

ASSESSMENT BATTERY FOR CHILDREN (A-B-C)

(Kaufman and Kaufman, 1983)

- Norms: Normal and exceptional boys and girls, 2.5 to 12.5 years.
- Statistical Measures: Validity scores ranged from 0.60 to 0.75 when compared to WISC-R; test-retest reliability ranged from 0.82 to 0.95.
- Scoring: Raw scores are converted to standard scores which can be converted to percentiles and age norms.
- Equipment: Specially-designed test kit.
- Administration/
Organization: Individually, school and clinical setting. 45 minutes for preschool and 70 minutes for school age, no special training.

Performance Parameters and Test Items

1. Sequential Processing Scale: Hand movements, number recall.
2. Simultaneous Processing Scale: Spatial memory, matrix analogues, triangles, Gestalt closure, magic window.

McCARTHY SCREENING TEST

(McCarthy, 1978)

Norms:	Normal boys and girls, ages 4 to 6.5 years.
Statistical Measures:	Validity coefficients ranged from 0.44 to 0.57 when compared to Metropolitan Readiness Test. Reliability measured above 0.66.
Scoring:	Raw scores correspond to the 10th, 20th and 30th percentiles by age.
Equipment:	Testing booklets, drawing booklets, pencil and manual.
Administration/ Organization:	Individually, up to twenty minutes, no special training.

Performance Parameters and Test Items

1. Right-Left Orientation: Cognitive knowledge of right and left with regard to own body.
2. Verbal Memory: Repeating words and sentences to each child.
3. Draw a Design: Copies a circle, vertical line and a horizontal line.
4. Numerical Memory: Child repeats six sequences of digits to measure immediate memory.
5. Conceptual Grouping: Nine problems presented orally and child must classify and generalize.
6. Leg Coordination: Walking backwards, tiptoes walk a straight line, stand on one foot and skipping.

PURDUE PERCEPTUAL MOTOR SURVEY (PPMS)

(Roach and Kephart, 1966)

Norms:	Boys and girls, ages 6 to 10 years who do not have sensory or physical disabilities.
Statistical Measures:	Construct validity is 0.65 between teacher ratings and PPMS. Test-retest reliability is 0.95.
Scoring:	Procedures are qualitative and subjective based on four point rating scale. Each performance parameter determined separate.
Equipment:	Balance beam (2"x4"x8'), yardstick, small pillow, mats, chalkboard, chalk, penlight, PPMS achievement forms.
Administration/ Organization:	Individually in 45 minutes, training requires standardized administration procedures from manual.

Performance Parameters and Test Items

1. Balance and Posture:
 - A. Walking Board: Forward, backward, sideways.
 - B. Jumping: Both feet, one foot, skip, hop.
2. Body Image and Differentiation: Identification of body parts, initiation of movement, obstacle course, Kraus-Weber and angels in snow.
3. Perceptual Motor Match: Drawing one circle, drawing two circles simultaneously, drawing a lateral line, drawing two straight lines vertically simultaneously, writing.
4. Ocular Control: Movement of eyes following a penlight and convergence on objects.
5. Form Perception: Form and organization in copying seven geometric forms.

QUICK NEUROLOGICAL SCREENING TEST (QNST)

(Mutti, Sterling and Spalding, 1978)

- Norms: Boys and girls, ages 6 to 18 years, learning disabilities and normal (undifferentiated).
- Statistical Measures: Considered a valid measure (0.51) in determining learning disabilities when compared with Bender Visual Motor Gestalt Test. Test-retest reliability ranged from 0.41 to 0.93.
- Scoring: Performance items are totaled and fall into three categories: high, suspicious, normal.
- Equipment: Data collection sheets, recording forms, stopwatch.
- Administration/ Organization: Individually, 20 minutes, no special training required, developed for use by psychologists.

Performance Parameters and Test Items

1. Motor Planning and Sequencing: Hand skill, figure recognition and production, palm form recognition, finger to nose.
2. Visual and Auditory Perceptual Skills: Eye tracking, sound patterns.
3. Fine Motor Tasks: Thumb and finger circle, rapidly reversing repetitive hand movements, double simultaneous stimulation of hand and cheek.
4. Gross Motor Tasks: Arm and leg extension, tandem walk.
5. Balance and Cerebular-Vestibular Function: Stand on one leg, skip.
6. Disorders of Attention: Behavioral irregularities.

DEVELOPMENTAL TEST OF VISUAL MOTOR INTEGRATION (VMI)

(Beery and Buktenica, 1967)

- Norms: Normal boys and girls, ages 2 to 15 years.
- Statistical Measures: Validity is 0.89 comparing the VMI to chronological age. Test-retest reliability ranged from 0.83 to 0.87.
- Scoring: Each test item is scored separately based on pass or fail, age equivalency scores are based on the number of forms passed.
- Equipment: Forms or protocol books, scoring manual.
- Administration/Organization: Individual or group, 10 to 15 minutes, no special training, but must follow test manual format exactly.

Performance Parameters and Test Items

1. Copying 24 Geometric Shapes: Total number of forms completed, number of forms failed up to three consecutive failures, verticle line, horizontal line, circle, verticle-horizontal cross, right oblique line, square, left oblique line, oblique cross, triangle open square and circle, three line cross, directional arrows, two rings, six circle triangle, circle and tilted square, verticle diamond, tilted triangles, eight dot circle, Wertheimer's hexagons, horizontal diamond three rings, necker cube, tapered box, three-dimensional star.

DEVELOPMENTAL TEST OF VISUAL PERCEPTION (DTVP)

(Frostig, 1963)

- Norms: Normal boys and girls, ages 4 to 8 years.
- Statistical Measures: Validity ranged from 0.44 to 0.50 when comparing the DTVP to teacher ratings of motor coordination and intellectual functioning. Test-retest reliability was equal to or below 0.70.
- Scoring: Raw scores may be converted to a ~~perceptual quotient or perceptual age.~~
- Equipment: Test booklet, administration and scoring manual, colored pencils.
- Administration/ Organization: Individual (45 minutes) or a group up to 6 (1 hour), no special training, but must follow manual guidelines.

Performance Parameters and Test Items

1. Eye-Motor Coordination: Involves the drawing of continuous straight, curved or angled lines between boundaries of various widths, or from point to point without guidelines.
2. Figure Ground: Involves shifts in perception of figures against increasingly complex grounds; intersecting and hidden geometric forms are used.
3. Form Constancy: Involves the recognition of certain geometric figures presented in a variety of sizes, shadings, textures and positions in space.
4. Positions in Space: Involves the discrimination of reversals and rotations of figures presented in series.
5. Spatial Relations: Involves the analysis of forms and patterns that consist of lines of various lengths and angles that the child is required to copy using dots as guides.

BENDER VISUAL MOTOR GESTALT TEST

(Bender, 1964)

- Norms: Boys and girls, ages 5 to 12 years.
- Statistical Measures: Validity and reliability not reported.
- Scoring: Raw scores are converted to age norms and grade levels.
- Equipment: Pencils, three sheets of paper, geometric figures.
-
- Administration/
Organization: Individually, amount of time depends on child's abilities, (Minimum of three minutes), no special training.

Test Items (Reproduce Geometric Shapes)

1. Copying Nine Geometric Shapes: Distortion of shape, disproportion, rotation, integration, perseveration.
2. Emotional Indicators: Confused order, dashes for circles, overwork, second attempt, expansion.

APPENDIX E
Motor Ability Tests

BRUININKS-OSERETSKY TEST OF MOTOR PROFICIENCY

(Bruininks, 1978)

Norms:	Normal boys and girls, ages 4.5 to 14.5 years.
Statistical Measures:	Validity ranged from 0.65 to 0.87. Test-retest reliability coefficients ranged from 0.60 to 0.89.
Scoring:	Raw scores converted to percentile ranks, stanines, and age norms. Raw scores determined by times, repetitions and pass/fail.
Equipment:	Specially-designed test kit, stopwatch.
Administration/Organization:	Individually. Complete test battery (46 items) takes 45-60 minutes. Short form (14 items) takes 15-20 minutes. No special training.

Complete Test Battery Items and Performance Parameters

Gross Motor Composite

1. Running Speed and Agility: Speed of total body movement and change of direction.
2. Balance: Standing on preferred leg on floor, standing on preferred leg on balance beam, standing on preferred leg on balance beam with eyes closed, walking forward on walking line, walking forward on balance beam, walking forward heel to toe on walking line, walking forward heel to toe on balance beam, stepping over response speed stick on balance beam.
3. Bilateral Coordination: Tapping feet alternately while making circles with fingers, tapping foot and finger on same side synchronized, tapping foot and finger on opposite side synchronized, jumping in place with leg and arm on same side synchronized, jumping in place with leg and arm on opposite side synchronized, jumping up and clapping hands, jumping up and touching heels with hands, drawing lines and crosses simultaneously.
4. Strength: Standing broad jump, sit-ups, knee push-ups, and full push-ups.

BRUININKS-OSERETSKY TEST OF MOTOR PROFICIENCY
(continued)

5. Upper Limb Coordination: Bouncing a ball and catching it with both hands, bouncing a ball and catching it with preferred hand, catching a tossed ball with both hands, catching a tossed ball with preferred hand, throwing a ball at a target with preferred hand, touching a swinging ball with preferred hand, touching nose with index fingers and eyes closed, touching thumb to fingertips with eyes closed, and pivoting thumb and index finger.

Fine Motor Composite

6. Response Speed: Reaction time of hand and fingers.
7. Visual-Motor Control: Cutting out a circle with preferred hand, drawing a line through a crooked path, drawing a line through a straight path, drawing a line through a curved path, copying a circle, copying a triangle, copying a horizontal diamond, copying overlapping pencils.
8. Upper Limb Speed and Dexterity: Placing pennies in a box with one hand, placing pennies in a box with both hands, sorting shape cards, stringing beads, displacing pegs, drawing verticle lines, making dots in circles, making dots.

Short Form Parameters and Test Items

1. Running Speed and Agility: Speed of total body movement and change of direction.
2. Balance: Standing on preferred leg on balance beam, walking forward heel to toe on balance beam.
3. Bilateral Coordination: Tapping feet alternately while making circles with fingers, jumping up and clapping hands.
4. Strength: Standing broad jump
5. Upper Limb Coordination: Catching a tossed ball with both hands, throwing a ball at a target.
6. Response Speed: Reaction time of hand and fingers.
7. Visual-Motor Control: Drawing a line through a straight path, copying a circle, copying overlapping pencils.
8. Upper Limp Speed and Dexterity: Sorting shape cards, making dots in circles.

BASIC GROSS MOTOR ASSESSMENT

(Hughes, 1971)

- Norms: Normal boys and girls, ages 6 to 12 years.
- Statistical Measures: Validity and reliability were not reported.
- Scoring: Raw scores totaled and compared to "overage" (mean) scores, scoring range is from 3 to 0 where 3 indicates expected performance.
-
- Equipment: Masking tape, stopwatch, tape measure, whiffle ball, 6-inch diameter rubber ball, 6 bean bags, 2 one-gallon bleach bottles, heavy string, 1 tennis ball, large (15'x20') clean space.
- Administration/Organization: Individually, 20 minutes. No special training required.

Performance Parameters and Test Items

1. Static Balance: Standing balance on left leg and right leg.
2. Ability to Coordinate Both Sides of Body with Rhythm: Stride jumping.
3. Dynamic Balance (Ability to Maintain Balance While Moving): Walking on taped line.
4. Rhythm, Body Control and Balance: Hopping.
5. Ability to Use Both Sides of the Body Coordinated in a Moving Activity: Skipping.
6. Hand-Eye Coordination: Target throw.
7. Eye-Hand Coordination: Hand preference and body control, yo yo.
8. Eye-Hand Coordination: Ball handling skills (catch, throw, and control the ball).

BASIC MOTOR ABILITY TEST (BMAT)

(Arnheim and Sinclair, 1979)

Norms:	Normal boys and girls, ages 4 to 12 years.
Statistical Measures:	Validity not reported. Test-retest reliability was 0.93.
Scoring:	Raw scores are converted to percentiles for each test item.
Equipment:	Stopwatch, stringing beads, shoelace, wastepaper basket, 10 bean bags, two 8-ounce margarine containers, 30 marbles, yardstick, mats, blindfold, 1-3/4-inch balance board, basketball, 50-foot tape measure, 2 nerf balls (3-inch diameter), rubber playground ball (10-inch diameter), 4 chairs.
Administration/ Organization:	Individually (20 minutes) or group of five children (30 minutes). No special training.

Performance Parameters and Test Items

1. Bead Stringing: Bilateral eye-hand coordination and dexterity.
2. Target Throwing: Eye-hand coordination associated with throwing.
3. Marble Transfer: Finger dexterity and speed of hand movement crossing body plane.
4. Back and Hamstring Stretch: Flexibility of back and hamstring muscles.
5. Standing Long Jump: Explosive strength in the leg extensors.
6. Face Down to Standing: Speed and agility in changing body positions.
7. Static Balance: Static balance (remain still) with eyes open and with eyes closed.
8. Basketball Throw: Arm and shoulder girdle explosive strength.

BASIC MOTOR ABILITY TEST (BMAT)
(continued)

9. Ball Striking: Coordination associated with striking.
 10. Target Kicking: Eye-foot coordination.
 11. Agility Run: Speed and change of direction of total body movement.
-

SIX CATEGORY GROSS MOTOR TEST

(Cratty, 1969)

- Norms:** Boys and girls, trainable mentally retarded, ages 5 to 24 years, educable mentally retarded, ages 6 to 20 years, and normal children, ages 4 to 11 years.
- Statistical Measures:** Validity is not reported. Test-retest reliability was 0.91.
- Scoring:** Scoring is based on a five-point rating scale in which criteria gets progressively more difficult. Average scores are determined for each item.
- Equipment:** Mats, stopwatch, 8-inch playground rubber ball, rubber softball held on a string (18 inches long), 4'x6' mat marked off in 12-inch squares, scoring sheet.
- Administration/ Organization:** Individually in 30 minutes. No special training required.

Performance Parameters and Test Items

1. **Body Perception:** Being able to lie on mat in various positions (prone, supine, side).
2. **Gross Agility:** Amount of time to go from supine position to a standing position.
3. **Balance:** Amount of time child can stand on one foot.
4. **Locomotor Agility:** Crawling, walking, jump forward, jump backward, hop on one foot.
5. **Ball Throwing:** Throwing technique, from pushing to proper form.
6. **Ball Tracking:** Catching a bounced ball, touching softball on string with index finger.

TEST OF MOTOR IMPAIRMENT

(Stott, Hayes and Henderson, 1984)

Norms:	Normal boys and girls, ages 5-12 years.
Statistical Measures:	Validity not reported, test-retest reliability averaged 0.75.
Scoring:	Scores are converted to pass (1.5), borderline (3.5) and fail (5.5), the higher the score, the greater the impairment.
Equipment:	Specially designed test kit, table and two chairs.
Administration/Organization:	Individual, up to 60 minutes depending on motor difficulties, no special training.

Test Battery Items for Age Bands

Age Band 1 (5-6 yrs.)

1. Manual Dexterity--Pasting coins, threading beads, flower trail.
2. Ball Skills--Catching a bean bag, rolling a ball into a goal.
3. Balance--One leg balance, jumping over cord, walking heels raised.

Age Band 2 (7-8 yrs.)

1. Manual Dexterity--placing pegs in holes, threading lace, flower trail.
2. Ball Skills--Bouncing and one hand catch, throwing bean bag.
3. Balance--Stork balance, jumping in squares, heel-toe walking.

Age Band 3 (9-10 yrs.)

1. Manual Dexterity--shifting pegs by rows, threading nuts on bolt, flower trail.
2. Ball Skills--Catching off wall with two hands, throwing bean bag.
3. Balance--One board balance, hopping in squares, balance ball while walking.

Age Band 4 (11-12 yrs.)

1. Manual Dexterity--piercing holes, cutting out elephant, flower trail.
2. Ball Skills--catching off wall with one hand, hitting target.
3. Balance--two board balance, jumping over cord and clapping, walking backwards.

APPENDIX F
Comprehensive Motor Performance Tests

BASIC MOTOR FITNESS TEST

(Hilsendager, 1972)

- Norms:** Normal, emotionally disturbed, brain damaged and mentally retarded boys and girls, ages 4 to 18 years.
- Statistical Measures:** Possesses face validity. Test-retest reliability not reported.
- Scoring:** Two levels of tests: pass/fail and in ratios. Total score expressed in Hull scores.
- Equipment:** Stopwatch, balance beam, mats, stairs, soft cloth ball, 8-inch rubber ball, 18-inch bench, flexibility tester, 5-pound medicine ball, Jamar Manuometer, track or large flat surface for running.
- Administration/Organization:** Individually or two children, 20 minutes for each section (level). No special training.

Test Items

Level I

- | | |
|----------------------|----------------------|
| 1. Walk | 11. Hop, left foot |
| 2. Creep | 12. Skip |
| 3. Stand, both feet | 13. March |
| 4. Stand, right foot | 14. Catch |
| 5. Stand, left foot | 15. Throw, right arm |
| 6. Jump, 1 foot lead | 16. Throw, left arm |
| 7. Jump, both feet | 17. Kick, right foot |
| 8. Climb, stairs | 18. Kick, left foot |
| 9. Hop, both feet | 19. Ball Bounce |
| 10. Hop, right foot | |

Level II

- | | |
|------------------------|-------------------------|
| 1. Standing Broad Jump | 8. Pull |
| 2. Balance Beam | 9. 35-Yard Dash |
| 3. Agility Run | 10. Medicine Ball Throw |
| 4. Sit-Ups | 11. Flexibility |
| 5. Right Grip | 12. 300-Yard Dash |
| 6. Left Grip | 13. Endurance Index |
| 7. Push | |

ADAPTED PHYSICAL EDUCATION ASSESSMENT SCALE,
ELEMENTARY LEVEL

(Los Angeles Unified School District, 1981)

Norms:	Boys and girls, ages 5 to 12 years, normal and various disabilities.
Statistical Measures:	Validity is not reported. Test-retest reliability scores all were above 0.70 on each test item.
Scoring:	Raw scores are transferred to percentile ranks (5-99 percent). Raw scores may be expressed in ratings, distance, repetitions and categorical data.
Equipment:	Eight-inch rubber ball, 18-inch ruler, colored arm bands, 5 bean bags (6"x6"), stopwatch, chalk, mats, masking tape, charts and score sheets.
Administration/ Organization:	Individually (20 minutes) or in groups of up to five (30 minutes). No special training required.

Performance Parameters and Test Items

1. Perceptual Motor Function: Ocular control, imitation of postures, one legged stand and balance (right leg, left leg and eyes open and closed), alternate hopping, arbrythmical hopping.
2. Motor Development: Throwing, kicking a stationary ball.
3. Motor Achievement: Catching, kicking a rolling ball, running form, jumping form.
4. Physical Fitness: Agility run, verticle jump, curl up, endurance run.
5. Posture: Pronated ankles, high hips, kyphosis, high shoulders, lordosis, abdominal ptosis, round shoulders, winged scapular, and forward head.

ADAPTED PHYSICAL EDUCATION ASSESSMENT SCALE,
SECONDARY LEVEL

(Los Angeles Unified School District, 1982)

- Norms: Boys and girls, ages 12-16 years, normal and various disabilities.
- Statistical Measures: Validity and reliability are presently being conducted.
- Scoring: Raw scores are transferred to percentile ranks (5-99 percent), raw scores expressed in ratings, distance, repetitive and categorical data.
- Equipment: Stopwatch, chalk, softball, soccer ball, 6" beanbag, 2 chalkboard erasers (2" X 5"), 2 tennis ball cores, wood paddle, 18" ruler, mats, score sheets.
- Facilities: Large wall, hard, marked running surface, handball court (30' X 20'), horizontal bar.
- Administration/ Organization: Individually or in groups up to five, 40 minutes, no special training required.

Performance Parameters and Test Items

1. Perceptual Motor Function--Standard balance, imitation of posture, alternate hopping, arrhythmical step hop.
2. Motor Achievement--Catching, throwing, kick for accuracy, paddle rally.
3. Physical Fitness--Flexibility, agility run, standing long jump, bent knee curl-up, flexed arm hang, six minute peg-walk.
4. Posture--(Quality of body alignment)--Pronated ankles, high hips, kyphosis, high shoulders, lordosis, round shoulders, winged scapular, forward head.

APPENDIX G

DATA BASE SOFTWARE USER GUIDE

DATA BASE SOFTWARE USER GUIDE

Use of the Apple-Works Data Base Program

Once the user is familiar with the Apple-Works keyboard and has working Apple-Works Startup, Program and Data disk, the user is ready to run the Apple-Works data base program.

Starting Apple-Works: The Apple-Works Startup and Program disks are used to start the data base program.

First, insert the Startup disk into Drive I. Second, turn the monitor and computer on. After a few seconds, Apple-Works will display the opening screen:

"Place the Apple-Works Program disk in Drive I and press Return."

To comply with instructions, remove the Startup disk from Drive I and insert the Program disk into Drive I and the data disk into Drive II and press "Return." Type in current date and press "Return" again.

Continuing Program Disk: For the "Main Menu," press "1" to "Add files to the desktop" and press "Return." Next, press 2 to "Get files from a different disk" and press "Return." "Disk drives you can use" now comes on the screen. Press 2 (Drive II) to change over to the Data disk. The Apple-Works files now appear with "Jays Data Base Program." Press "Return" to continue into the data base.

Use of Data Base Program: A list of all records (assessment instruments) will now be seen on the screen. Each assessment instrument parameter is listed.

The next step is the functional part of the program. It can give the operator a chance to select assessment instruments depending on choice of parameters.

Press the "open apple" and "R" (R) keys simultaneously to get to the selection stage of the program. The monitor will now show the following:

1. Assessment Category
2. Instrument
3. Descriptor 1
4. Descriptor 2
5. Descriptor 3
6. Descriptor 4
7. Descriptor 5
8. Descriptor 6
9. Descriptor 7
10. Ages
11. Administration
12. Training
13. Minutes
14. Norms

The following parameters are contained within each descriptor.

Descriptor 1: Strength, arm/shoulder girdle strength, leg strength, abdominal/hip flexor strength

Descriptor 2: Cardio-respiratory function, flexibility,

body composition, explosive leg power
Descriptor 3: Speed, balance, static balance, dynamic
balance

Descriptor 4: Eye/foot coordination, eye/hand
coordination, visual skills, figure
ground, constancy of shape

Descriptor 5: Perception of position in space,
perception of spatial relationship,
kinesthetic awareness, body movements

Descriptor 6: Body parts, body perception, laterality,
directionality, tactile discrimination

Descriptor 7: Bilateral coordination, rhythm, fine
motor, gross motor, posture

When making a parameter selection, type the parameter
in the above listed descriptor category for the correct
program display.

Three selections must be made for the computer to make
a response. It can be the same selection each time or three
different ones. Use the Arrows (| |) or type in numbers to
bring the curser to your choice of selection and press
"Return."

Your selection will come up and 12 items will appear on
the screen. Move the curser to "contains" or "equals" and
press "Return." Next, type in your response (example: age
equals "12") for your first selection. To continue, move the
curser to "or" and make your next selection. When making

the three selections, use "or" each time instead of "and."
This will keep the program open for the correct number of
assessment instruments which will be listed.

Example of Use:

1 Assessment Category equals "physical fitness"

-or-

10 Ages equal "12"

-or-

13 minutes equal "30"

Assessment instruments that match these three
selections will appear on the screen. In order to find out
more information about a particular assessment instrument,
press the "open apple" and "Z" (Z) keys.

When a response is given by the computer, it displays
"Select all records?" at the bottom of the screen. To
continue, press "No" and the 14 records will be displayed
again.

To quit the Apple-Works program, press "escape" until
you reach the Main Menu. Select option 6 ("Quit") and
answer "yes." Turn off computer and monitor and take disks
out of Drives I and II.

APPENDIX I
ASSESSMENT INSTRUMENT LIST AT
UNIVERSITY OF THE PACIFIC
SCHOOL OF EDUCATION
(AS OF 7/87)

APPENDIX H
ASSESSMENT INSTRUMENT LIST AT
SCHOOL OF EDUCATION
UNIVERSITY OF THE PACIFIC
(AS OF 7/87)

ASSESSMENT INSTRUMENT LIST AT
SCHOOL OF EDUCATION
UNIVERSITY OF THE PACIFIC
(AS OF 7/87)

1. AAHPERD Fitness Test for Mildly Mentally Retarded Persons
2. AAHPERD Health Related Physical Fitness Test
3. AAHPERD Youth Fitness Test
4. Adapted Physical Education Assessment Scale--Elementary
5. Adapted Physical Education Assessment Scale--High School

6. Assessment Battery for Children (A-B-C)
7. Basic Gross Motor Assessment
8. Basic Motor Ability Test (BMAT)
9. Basic Motor Fitness Test
10. Bayley Scales of Infant Development
11. Bender Visual Motor Gestalt Test
12. Benton Visual Retention Test
13. Brigance Diagnostic Inventory
14. Bruininks-Oseretsky Test of Motor Proficiency
15. Denver Developmental Screening Test
16. Developmental Test of Visual Motor Integration
17. Elementary School Physical Fitness Test
18. Frostig Program for the Development of Visual Perception
19. McCarthy Screening Test
20. Milani Comparetti Test of Reflex Development
21. Physical Performance Test for California
22. Purdue Perceptual Motor Survey
23. Quick Neurological Screening Test
24. Sensorimotor Integration Test
25. Six-Category Gross Motor Test
26. Test of Gross Motor Development
27. Test of Motor Impairment