

**NORMING AND EVALUATION OF THE BRIGANCE
K & 1 SCREEN FOR KINDERGARTEN AND FIRST GRADE**

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An Abstract
Presented to the
Graduate and Research Council of
Austin Peay State University

In Partial Fulfillment
of the Requirements for the Degree
of Education Specialist

by
Carol Marie Ryan
August, 1989

ABSTRACT

This research presents the results of norming the Brigance K & 1 Screen for Kindergarten and First Grade and evaluates the test as a criterion-referenced readiness test. Scores of 212 entering kindergarten students from the Clarksville-Montgomery County School System were computed for descriptive statistics, and t-tests were run comparing male and female scores.

Results suggest that the Brigance Screen is not appropriate as a norm-referenced test for developmental screening. The distribution of scores was an extreme negatively skewed curve, unrepresentative of a normal curve distribution. Its use as a criterion-referenced reading and math readiness test was also questionable due to limited items and an arbitrary scoring system. The tests' suitability as a component of Tennessee's required pre-first grade screening program is discussed. Implications for future research are presented.

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To the Graduate and Research Council:

I am submitting herewith a Field Study written by Carol Marie Ryan entitled "Norming and Evaluation of the Brigance K & 1 Screen for Kindergarten and First Grade." I have examined the final copy of this paper for form and content, and I recommend that it be accepted in partial fulfillment of the requirements for the degree of Education Specialist, with a major in School Psychology.


Major Professor


Second Committee Member


Third Committee Member

Accepted for the Graduate
and Research Council:


Dean of the Graduate School

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CHAPTER 1

Introduction

Pre-first grade screening is a measurement activity used to identify problems which might interfere with a child's school adjustment. Screening programs for pre-school and kindergarten children became a widespread practice during the 1960's and 70's, in response to preventative early childhood education and the need to identify children with handicaps. Screening programs involve gathering information about a child's development as it relates to his success in an educational setting.

Several instruments have been developed to assess particular areas of development, such as social development, visual and auditory perception, gross and fine motor control, speech and language, and reading and math readiness. Confusion exists as to the purpose and interpretive value of these instruments and how they can best be used. Meisels (1987) cautioned that the two types of screening instruments, developmental and readiness, should be reliable and appropriately validated for their purposes. Developmental screening tests should be norm-referenced and have predictive validity. Readiness tests should be criterion referenced and have construct validity. The quality of many of these screening instruments is in question, and there is little evidence to support their effectiveness (Barnes, 1982).

Screening is required by TCA 49-2941, a Tennessee law which states that "prior to admission into first grade, a developmental screening profile shall be completed for every child" (Tennessee, 1985, p. 2.4). The screening involves gathering information in the following areas: medical, vision, hearing, visual perception, auditory perception, gross motor, fine motor, social development, speech and language, and readiness in math and reading. The purpose of the screening is to provide data for use in placement of first graders in appropriate academic programs, instructional planning, referral of students for further evaluation, and program evaluation.

The Brigance K & 1 Screen for Kindergarten and First Grade (Brigance Screen) is a suggested instrument to screen the development of visual perception, auditory perception, gross motor and fine motor skills (Tennessee, 1985). It is a criterion-referenced instrument individually administered to students. The testing manual suggests that the results be used for screening, placement, instructional planning, and pupil evaluation.

The Clarksville-Montgomery County School System has used the instrument since 1984. The test results are being used for all four purposes mentioned in the manual, depending on the needs of the students and how each elementary school develops its program. Some schools group kindergartners based on test results, some use it as a

screening device to identify students in need of further evaluation, and others make little use of the information beyond reporting results to parents. The Chapter I reading program uses a cut off score of 70 on the Brigance Screen to identify first grade students eligible for this remedial program. Although the Brigance Screen is not a standardized test, it is used since no other standardized achievement scores are available for entering first graders in the Montgomery County School System. The Stanford Achievement test scores are available for the other grade levels.

The appropriateness of the Brigance Screen to meet the requirements of the developmental and readiness screening mandated by the state needs to be evaluated. Since the Brigance Screen is used to assess developmental areas, there is also a need to establish local norms. These data would enhance its usefulness in the early identification of students with handicapping conditions.

This study used data from the 1986-87 and 1987-88 school years to determine whether or not local norms could be established for the Brigance Screen which is administered to entering kindergarten students. These data may then be used to enhance appropriate referrals and aid in the early identification of children with handicaps. The information may also be useful in determining the appropriateness of this test as a component of the pre-first grade screening program.

CHAPTER 2

Review of the Literature

Development of Screening Programs

The definitions of screening vary depending on their particular purpose and the author's perspective. In general, screening means to separate from a group individuals who may not develop normally or will not perform well in a particular setting. There are screening programs for medical diseases, employment, and educational programs. Screening may involve several areas of development and may include techniques such as observation, interview, and measurement procedures.

Screening of pre-school and kindergarten children is now a widespread practice brought about by research, educational trends, and legislation. There is presently much confusion as to the purpose of these programs and the appropriateness of the instruments used. Some programs are conducted for preschool children to identify potential handicaps; other screening programs are conducted on kindergarten children to determine readiness for school. Still other programs attempt to do both at the same time, as well as to evaluate programs and modify the curriculum. In order to clarify this confusion, the purposes of the screening program must be clearly stated, and the instruments used must be reliable and validated for that purpose (Barnes, 1982; Lichtenstein & Ireton, 1984; Meisels, 1987;

Zeitlin, 1976).

Pre-school and kindergarten screening have been promoted by three different movements over the last thirty-five years. These movements include: 1) early enrichment and compensatory education, 2) pediatric screening, and 3) special services for handicapped children. Early enrichment and compensatory education had its largest growth through Project Head Start which was founded through the Economic Opportunity Act of 1965. Critical to this program was the assumption that environment and education are primary determinants of intellectual functioning and early enrichment can counteract the effects of early deprivation and limited opportunities (Lichtenstein & Ireton, 1984).

Pediatric screening was boosted by federal legislation in 1967 which established the Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) program to serve young people eligible for Medicaid. The purpose was to help detect and prevent conditions that lead to chronic and disabling ailments. EPSDT was somewhat unsuccessful due to lack of funds and lack of interest by professionals and parents (Lichtenstein & Ireton, 1984).

In 1975, Congress passed the Education for All Handicapped Children Act, Public Law 94-142. It placed the responsibility of identifying handicapped children with the public schools. Special services were targeted for children aged 3-21. Services for children three through five could

be provided if they did not conflict with court order or state law or practice (Lichtenstein & Ireton, 1984). Most states provided programs for five year olds, but many did not provide services for three or four year olds. In 1987, Public Law 99-457 was passed which extended services to all handicapped children ages three through five. If a state is to continue receiving federal funds for this age group under PL 94-142 or EHA discretionary programs, services must be provided for all handicapped children aged three through five beginning with the 1990 school year.

Although PL 94-142 did not mention pre-school screening as a means of identifying handicapped children, many school systems and agencies adopted the screening approach. A typical pre-school screening program is designed to identify three and four year olds at risk of developing handicapping conditions related to school adjustment. This type of screening involves collecting data on the developmental functioning of the young child.

Kindergarten screening may have the same purpose as pre-school screening, or it may have additional purposes depending on the philosophy of the educational agency conducting the screening. One popular reason for screening is to determine readiness for kindergarten. The Gesell Institute strongly supports the concept of school readiness and the Developmental Placement Programs (Ilg, Ames, Haines, Gillespie, 1978). These programs consist of screening all

applicants before kindergarten entrance. The results of the screening are used to determine if the child is ready for kindergarten, pre-kindergarten, or not ready at all for a school program. At the end of the first year in school, the children are screened again to determine placement in kindergarten, pre-first grade, or first grade. This program allows for more slowly developing children, especially boys, to have as many as three years of school before first grade. "It is our position that through proper school placement perhaps 50% of school failures can be remedied or prevented" (pp. 11-12). The Gesell Preschool Test reflects a maturationist theory of development which focuses on time as the crucial variable in behavior change. Time to mature is the key variable as opposed to environmental stimulation or intervention (Meisels, 1987).

Shirley Zeitlin (1976) views kindergarten screening as a step toward humanizing education. The goal of screening is to set appropriate expectations for all children and to design appropriate experiences for success. The screening program is designed to identify children who may be high risk learners and need to be referred for further diagnosis. She stresses screening should never be used for placement or exclusion of children. Kindergarten screening is a more efficient means of reaching children than pre-school programs.

A third viewpoint disputes the value of kindergarten

mass screening for the early identification of children with developmental, physical, or sensory problems which interfere with learning and adjustment to school. Lichtenstein and Ireton (1984) suggest the most practical approach is to rely on teacher referral to identify children who may have special needs. The use of systematic observation by kindergarten teachers has been shown to be as effective as and more economical than formal testing. Even when screening is instituted, a trial placement in regular kindergarten may be a reasonable screening recommendation, except for the most disabled children.

Readiness versus Developmental Screening

Meisels (1987) has written about the confusion between readiness tests and developmental screening tests. Because of the confusion between these two types of tests and the use of readiness tests in the process of identification and placement, young children may be denied an appropriate education because of labels such as young, developmentally immature, or not ready. The two types of tests are designed to accomplish different objectives. Table 1 contrasts the two types of tests in terms of purpose, content, type of test, and psychometric properties. Developmental screening tests are designed to access a child's developmental abilities highly associated with school success. Readiness tests are designed to measure skills that are prerequisite for a specific instructional program such as

Table 1

Contrasts between Developmental Screening Tests and Readiness Tests

	Developmental Screening Tests	Readiness Tests
Purpose	to identify children who might need early intervention or special education	to facilitate curriculum planning
	to identify children who might profit from modified or individualized classroom program	to identify a child's relative preparedness to benefit from a specific academic program
Content	items that display a child's ability or potential to acquire skills	items that focus on current skill achievement, performance and general knowledge
Type of test	norm-referenced	most criterion-referenced some are norm-referenced
Psychometric properties	reliability predictive validity	reliability construct validity

(Meisels, 1987)

reading and math.

The term development is used to describe the orderly sequence of behaviors displayed by most normal children over a period of time. Secondly, it refers to the underlying mental processes, including representation, memory, reasoning, and judgment. Third, development refers to the processes that contribute to, or interfere with, the emergence of the developmental functions. It becomes necessary to have developmental norms in order to understand what is expected per age and likewise to determine if a child is developmentally delayed (Lichtenstein & Ireton, 1984). Standardized, normed instruments are used to measure the developmental abilities associated with school success.

Meisels states the most frequent abuse of tests in screening programs is using tests which have no established reliability and validity. Another abuse is the substitution of readiness tests for developmental tests. According to Meisels, readiness tests should be used for curriculum planning, not to identify children who may need special services or intervention.

One of the major differences between developmental screening and readiness tests is whether they are norm-referenced or criterion-referenced. Ebel (1979) compares and contrasts norm-referenced tests and criterion-referenced tests in four areas: 1) the kind of information provided, 2) the basis for interpreting information, 3) distribution

of items over the domain of achievement measured, 4) the use made of the information provided.

The first difference is in distinguishing the kind of information a test gives. A criterion-referenced test is used to determine which specific objectives a particular pupil has attained. Then remediation or more advanced objectives may be presented to the child. Norm-referenced tests are used to determine a pupil's overall knowledge of a specific subject. In other words, does the child know very much or very little about the subject.

The second difference between norm-referenced and criterion-referenced tests is the basis for interpreting the information. The interpretation of criterion-referenced tests is based on the proportion of objectives mastered. The interpretation of a norm-referenced test is based on the standing of a particular student among those in the specified group.

A third difference between criterion- and norm-referenced tests is in the distribution of items over the domain of achievement samples. The items on a criterion-referenced test cluster around a limited number of specific objectives in an area of achievement. The items on a norm-referenced test are diffused more widely across the domain of learning.

The fourth difference between criterion- and norm-referenced tests is in the use made of the information

provided. The purpose of a norm-referenced test is to indicate a student's degree of success in learning or level of development as compared to the typical student. A criterion-referenced test is used with instructional procedures to insure that certain things will be learned. Ebel (1979) states that although the individual test items in the two types of tests may be indistinguishable, it is the way they are interpreted that is meaningful.

Tennessee State Law

The State of Tennessee mandates by law (TCA 49-2941) that a pre-first grade screening program be conducted by all public schools. This law states that, prior to admission into first grade, a developmental screening profile shall be completed for every child. The purpose of this screening program is to provide data to be used for 1) placement of first grade students into appropriate academic programs, 2) instructional programming, 3) referral for further evaluation, and 4) kindergarten program evaluation. The guidelines also suggest that utilization of this screening information should provide Special Education with a good data source for referral. The components of Tennessee's pre-first grade screening program include the following areas: medical, vision, hearing, development (visual perception, auditory perception, gross motor, and fine motor), social development, speech and language, and readiness in reading and math. This pre-first grade

screening law appears to have both of the purposes of developmental screening tests and readiness tests inherent within its framework. Placement of first grade children into appropriate academic programs would include information from a valid and reliable readiness test. Referral for diagnosis of a handicapping condition would require data from normed developmental screening instruments.

The Brigance Screen is suggested in the Tennessee Student Evaluation Manual as an instrument to use as part of the screening program. Its use is suggested for measuring development in the areas of visual perception, auditory perception, gross motor and fine motor skills. The Clarksville-Montgomery County School System also uses the test as one instrument to assess reading and math readiness. The Brigance Screen is given twice a year to kindergarten students. The Brigance kindergarten screen is administered to entering kindergartners within the first two weeks of school. The Brigance first grade screen is administered to kindergartners during the last month of school.

Brigance K & 1 Screen for Kindergarten and First Grade

The Brigance K & 1 Screen for Kindergarten and First Grade (Brigance Screen) is a criterion-referenced assessment instrument published in 1983. The screening procedures and materials were designed specifically to assist in the acquisition and evaluation of data necessary for the admission of a student to either kindergarten or first

grade. The author suggests it be used for screening, placement and grouping, program development, and pupil evaluation. Albert H. Brigance developed the test by excerpting or adapting assessments from the Brigance Diagnostic Inventory of Early Development (Birth-7 years) and the Brigance Diagnostic Inventory of Basic Skills (K-6th). He added a picture vocabulary assessment not contained in either of these two inventories.

The Brigance Diagnostic Inventory of Early Development (IED) (1978) is a developmentally sequenced criterion-referenced test for use with infants and children whose developmental nature ranges from birth through six years. The test is based on a developmental task-analytic model which combines normed and criterion elements. The test has no self-contained normative data base. Item placement and skill sequencing were accomplished by reviewing traditional scales and resources (eg; Gesell, Bayley, Griffith, White, Lavatelli). Developmental ages at which skills are typically mastered were derived from this literature review and are included with each assessment subdomain. The test was not normed after it was constructed. The manual offers little reported research data on reliability and validity. The results are easily translated into instructional objectives or development of Individualized Education Programs (IEP) with goals and objectives for teaching children in pre-school and early intervention programs

(Bagnato, 1985; Gary, 1985).

Eleven functional domains are assessed with 98 items. The areas tested include pre-ambulatory motor skills, gross motor skills, fine motor skills, self-help skills, pre-speech, speech and language, general knowledge and comprehension, reading readiness, basic reading skills, manuscript writing, and math (Mitchell, 1985, p. 218).

The Brigance Diagnostic Inventory of Basic Skills (IBS) (1979) is a criterion-referenced inventory of academic readiness, reading, language arts, and math skills for grades kindergarten through sixth grade. It is considered one of the most comprehensive elementary grade-level criterion-referenced instruments. Items were selected from various developmental scales, existing word lists, and grade level texts. The exact scores available on the IBS were derived from text referencing and not from a norm group. Reliability and validity data are absent from the manual. No empirical evidence or rationale is offered for the selection of cutoff scores to determine mastery of particular skills. Reviewers judge that the IBS has good content validity, is a good general measure of learned skills, and can be used to develop curriculum objectives. However, the test can not be used to group children into reading groups, diagnostic categories, or student classification (Smith, 1985; Witt, 1985).

Readiness skills assessed include: naming colors,

copying designs, drawing shapes from memory, drawing a person, recognizing body parts, following directional and verbal instructions, articulating sounds, writing and comprehending numbers, naming and writing letters, and writing names. In addition, the student is tested in gross-motor coordination, fine-motor self-help skills, verbal fluency, and visual discrimination.

The Brigance Screen, which was derived from these two Brigance Diagnostic Inventories, is comprised of 18 subtests. Five are used solely for kindergartners and six solely for first graders. Seven subtests are for both age levels. The kindergarten battery consists of 12 subtests: Personal Data Response, Color Recognition, Picture Vocabulary, Visual Discrimination, Visual-Motor Skills, Gross-Motor Skills, Rote Counting, Identification of Body Parts, Follows Verbal Directions, Numeral Comprehension, Prints Personal Data, and Syntax and Fluency. The first grade battery consists of 13 subtests: Personal Data Response, Color Recognition, Picture Vocabulary, Visual Discrimination, Visual-Motor Skills, Draw-a-Person, Rote Counting, Recites Alphabet, Numeral Comprehension, Recognition of Lower Case Letters, Auditory Discrimination, Prints Personal Data, and Numerals in Sequence. Throughout the battery, supplemental assessments are suggested for each subtest. Very little information is given for interpreting the responses to these supplemental questions. One can

administer the additional items, but there are no criteria for scoring the items.

In addition to the basic assessments, five advanced subtests are provided for individuals who score above 95 on the basic battery. Again no scoring procedure or system by which to interpret responses is suggested for the advanced tasks. On the Response to Picture subtest, the examiner may ask several questions about a picture to assess the student's skill for interpreting and verbally responding. On the Articulation of Sounds subtest the examiner asks the students to name pictures to determine how the initial sound is articulated. The student's ability to read is assessed with the Basic Preprimer Vocabulary and Reads Orally at Preprimer/Primer Level subtests. On the Basic Number Skills subtest, the student compares and identifies quantities, indicating more or less, and the differences.

The Brigance Screen provides checklists for others who are involved with the child. The examiner's observation checklist is for noting behaviors that reflect possible difficulties in the child's visual, auditory, speech, affective, motor, or physical performance. Checklists for parents and teachers highlight the areas of speech, readiness skills, visual and fine-motor skills, handedness and laterality, self-help skills, social skills, emotional/self-reliance skills, and physical health. The same questions are asked of parents and teachers at both the

kindergarten and first grade level. No interpretation or mastery level is suggested for each grade level.

The instrument is administered individually in a 10 to 20 minute period and no special training is required. The test is an oral and written test. The students are required to copy shapes, draw a man, and write their names. Materials needed include the manual which contains illustrations presented to the child, an appropriate pupil data sheet for the test administered, primary pencils, unlined paper, lined paper appropriate for kindergarten or first grade, and a time piece. Also needed are ten objects to count and various objects from a classroom. The manual is arranged so it can be laid flat on the table between the examiner and student. Instructions for each subtest are provided in an easy-to-read format so the manual does not have to be turned. Only the pages need to be turned as one progresses through the test.

Each test has a composite score of 100 points. Skill areas are given various point weights so the total score conveniently maximizes at 100. For example, knowing the color purple is worth one point on the kindergarten screen but worth one-half point on the first grade screen, requiring the child to know twice as much information to obtain the same score. Point values range from one-half to five for a correct response. For example, on the kindergarten screen a student receives two points for stating his

first name, two points for matching objects with the numeral, and two points for copying a square. The student receives one-half point for each numeral he correctly rote counts, and one-half point for each body part he identifies. The examiner may give five points each for speech which is understandable and for speaking in complete sentences. These are assessed from observation. Each subtest has a maximum score of five or ten. These scores seem convenient but were not justified empirically or theoretically (Helfeldt, 1984).

The Pupil Data Sheet includes sections where the assessor records observations, indicates which items a student misses, and computes subtest and total scores. There is a section for a summary rating which rates students lower, average, or higher as compared to other students tested. This rating is done by ranking scores of all the students in the class. A recommendation for placement into preschool, high, average, or low kindergarten may also be made. This recommendation is made based on how the student ranks compared to others assessed at the same time. The author also suggests that students receiving a score below 60 be evaluated in more detail.

The test claims to be both criterion- and curriculum-referenced in that results may be translated into curriculum objectives. In order to develop instructional objectives, one must refer to the two Brigance inventories from which it

was developed and use the format provided to translate results. The testing manual includes a chart which correlates items from the Brigance Screen to items on the IED and IBS. In addition, prerequisite skills and higher level skills for each item are listed. Thus, if a student's performance is below or above skill level, the teacher may use the other two instruments for a more comprehensive assessment. The process of writing objectives and conducting a more comprehensive assessment requires the availability of these other instruments.

Helfeldt (1984) cautioned against using test performance to develop instructional objectives for two reasons. First, the skills are assessed in an isolated context, and teachers cannot conclude the skills are most effectively taught and learned in this fashion of rote memory. These include naming colors, letters, numerals, pictures, body parts, address, age, and name. In order to learn this information, a child must experience much repetition with the material in many different settings. The second reason stems from the author's explanation for developing a criterion-referenced test. Brigance was responding to the frustration teachers had in translating results of norm-referenced tests into remedial programs. Many norm-referenced tests were not designed for instructional planning; they were designed to compare individual performance to the performance of others on the test.

Many of the tasks on the Brigance Screen are similar to subtests on norm-referenced tests. Measurement of each skill is brief and out of context. Without the more extensive testing of each skill with the IED or IBS, one is not sure which instructional objectives need to be taught. If a child does poorly on an item, the teacher does not know if the lower level prerequisite skill is mastered. The same is true if a student masters the items; without more extensive testing of higher level skills, the teacher does not know what teachings are appropriate. The Brigance Screen neither provides specific enough information nor is complete enough to develop curriculum or individual educational plans. If teachers are serious about developing an instructional plan from the results of their testing, they should test each individual with the more complete Brigance inventories.

Descriptive or content validity of the Brigance Screen is generally considered to be sufficient (Boehm, 1985; Wright, 1985; Helfeldt, 1984). The subtest contents are similar to traditional reading readiness tests, such as the Metropolitan Readiness Test and the Early Detection Inventory (Helfeldt, 1984). Content validity is also suggested through field testing and critiquing in 53 schools in 14 states. Concurrence on appropriateness of each skill ranged from 86 to 100 percent. Only the task requiring entering kindergartners to print their first names had a

concurrency of 78 percent (Brigance, 1983).

Approximately half of the tasks rely heavily on background experience and rote memory. About one-third of the tasks are perceptual or motor in nature. Only Following Directions and Syntax and Fluency measure levels of subsequent development or cognitive functioning. The two criteria for Syntax and Fluency, talking in complete sentences and using understandable speech, are observed and not assessed with actual test items. There is also little measurement of listening comprehension, which is very important for predicting school success (Helfeldt, 1984).

A major purpose of the test is to rank students and make decisions on readiness or placement into high, average, or low groups. No normative data are provided to aid in these decisions, nor is predictive validity or reliability data provided which is essential for making such decisions (Boehm, 1985).

The test also assesses skills considered to be predictors of reading, such as letter name knowledge (Bond & Dykstra, 1967) and language development (Helfeldt, 1984). Measurement of language development on the Brigance Screen is poor, and the letter knowledge is assessed differently than with other tests. Since no functional validity studies have been conducted, its use as a reading readiness test is also questionable (Helfeldt, 1984).

Purpose of the Study

The purpose of this investigation was to determine if local normative data of the Brigance Screen could be provided for the Clarksville-Montgomery County School System. This normative data is the type of data needed for developmental screening. This information would aid teachers in making proper referrals to Psychological Services for further evaluation. The data would also help determine if placement decisions should be made on the basis of these test scores. Using normative data is a more valid method than ranking students. In order to investigate these concerns four hypotheses were tested:

1. The distribution of total scores will be skewed negatively.
2. The distributions of subtests scores will be skewed negatively.
3. The standard deviations of the subtests scores will be such that it will be impossible to score one standard deviation above the mean.
4. Gender will not have a significant effect on the total score.

The Brigance Screen will also be evaluated as to its strengths and weaknesses as a criterion-referenced test. The test will be evaluated on how well it meets the purposes suggested by the author. Its usefulness as a developmental

screening test and/or a readiness test will also be determined.

CHAPTER 3

Method

Subjects

The sample consisted of 212 kindergarten students from Clarksville-Montgomery County Schools. Protocols were selected from the 1987 fall testing of Ringgold and Norman Smith Elementary Schools. Classes were chosen randomly from each school. Students ranged in age from 4 years, 11 months to 6 years, 6 months. The sample consisted of 116 males and 96 females.

Instrument

The Brigance Screen for kindergarten is a brief instrument consisting of 12 subtests which measure knowledge of name, address, age, body parts, colors, numbers, letters, and names of objects. The subtests also measure development of fine motor, gross motor, visual discrimination, following directions, and name writing. The test is scored by assigning points to each subtest. These points are added together to total a possible 100 points. Based on the total number of points received the students are ranked. The manual suggests this ranking may be used to divide students into low, middle, or high groups.

Procedure

Pupil Data Sheets from the Brigance Screen (kindergarten battery) were collected from the Psychological Services Unit of the Clarksville-Montgomery County Schools.

permission was granted to use the data (see Appendix). The data collected included date of administration, age, gender, 12 subtest scores, and the total score.

Subjects were individually administered the Brigance Screen by kindergarten classroom teachers. Testing was done during the first weeks of school in the Fall, 1987. The students attended school in small groups of 5 or 6 each day. The teachers were then able to work individually with each student while the others participated in group activities. Testing time for each student was approximately 20 minutes.

After the data were collected, descriptive statistics were computed for the distribution of scores. Means and standard deviations for subtests and total scores were computed. Frequency distribution of total scores was calculated. T-tests were run to evaluate the hypothesis on age.

CHAPTER 4

Results

Descriptive statistics and t-tests for independent samples were computed on the data using the computer program Statistical Package for Effective Educational Decisions (Blair, 1985). Means and standard deviations were computed for all subtests and total test scores. T-tests were computed, comparing males and females for all subtests and total test scores.

Table 2 shows the maximum possible score, means, and standard deviations for each subtest and the total test scores. Mean scores for most subtests are near the maximum possible score attainable for each subtest.

Means and standard deviations were also examined in Table 2 to determine the possibility of scoring one standard deviation above the mean. Only two subtests met the criteria. Personal Data with a mean of 7.02, out of a possible 10, had a standard deviation of 1.91. Body Parts with a mean of 3.12, out of possible 5, had standard deviation of 1.24. It was also possible to score one standard deviation above the mean on the total test score. The mean for the total test score was 83.33, near the maximum score of 100. The standard deviation was 14.60.

Table 3 shows the skewness and kurtosis of each subtest and total test score. All subtest scores and the total test score were skewed negatively. Skewness ranged from -0.29 to

Table 2

Maximum Possible Score, Means, and Standard Deviations
of Subtests and Total Test Scores

Subtest	Possible Score	Mean	S.D.	Mean + one S.D.
Personal Data Response	10	7.02	1.91	8.93
Color Recognition	10	8.76	2.40	11.10
Picture Vocabulary	10	9.83	0.44	10.27
Visual Discrimination	10	8.68	2.56	11.34
Visual-Motor Skills	10	7.88	2.45	10.33
Gross-Motor Skills	10	9.28	1.34	10.62
Rote Counting	5	4.60	1.08	5.68
Identification of Body Parts	5	3.12	1.24	4.46
Follows Verbal Directions	5	4.47	1.03	5.71
Numeral Comprehension	10	8.12	3.38	11.50
Prints Personal Data	5	2.69	2.49	5.17
Syntax and Fluency	10	9.08	2.38	11.46
Total Score	100	83.83	14.60	98.51

Table 3

Skewness and Kurtosis for each Subtest
and Total Test Scores

Subtest	Skewness	Kurtosis
Personal Data Response	-0.32	0.04
Color Recognition	-2.19	3.84
Picture Vocabulary	-2.52	5.80
Visual Discrimination	-2.16	3.83
Visual-Motor Skills	-1.11	0.62
Gross-Motor Skills	-2.18	1.19
Rote Counting	-2.82	6.91
Identification of Body Parts	-0.29	-0.64
Follows Verbal Directions	-3.27	10.22
Numeral Comprehension	-1.51	0.69
Prints Personal Data	-0.15	-1.98
Syntax and Fluency	-2.61	6.03
Total Score	-1.56	2.04

-3.27 on the subtests, and was -1.56 for the total score. Peakness of the distributions of the individual subtests was varied. Kurtosis ranged from -1.98 for the subtest Prints Personal Name to 10.22 for the subtest Follows Directions. These two subtests were limited in the range of scores one could receive. Kurtosis for the total score was 2.04.

Frequency distribution revealed that 76 per cent of the students scored 80 or above, with 46 per cent scoring above 90. Ten per cent scored below 60 (Table 4).

T-tests for independent samples yielded no significant differences between scores obtained by females or males, except for the subtest Identification of Body Parts, with females scoring significantly higher (Table 5).

Table 4
Frequency Distribution of Total Test Scores

Range	Frequency	Percent	Cumulative %
90 - 100.0	97	45.97	100.00
80 - 89.5	63	29.86	54.03
70 - 79.5	18	8.53	24.17
60 - 69.5	13	6.16	15.64
50 - 59.5	11	5.21	9.48
40 - 49.5	5	2.37	4.27
30 - 39.5	4	1.90	1.90
20 - 29.5	0	0.00	0.00

Table 5

Results of the t-tests Comparing Subtest Scores
and Total Test Scores between Females and Males
on the Brigance K Screen

Subtest	t	p
Personal Data Response	-0.093	0.923
Color Recognition	0.375	0.710
Picture Vocabulary	1.183	0.236
Visual Discrimination	1.038	0.301
Visual-Motor Skills	-0.013	0.987
Gross-Motor Skills	0.738	0.468
Rote Counting	2.215	0.026
Identification of Body Parts	5.348	0.000
Follows Verbal Directions	-0.106	0.912
Numeral Comprehension	-0.561	0.583
Prints Personal Data	1.770	0.074
Syntax and Fluency	0.770	0.448
Total Score	1.188	0.234
Females N = 96		
Males N = 116		

CHAPTER 5

Discussion

The Brigance K & 1 Screen for Kindergarten and First Grade (Brigance Screen) is a criterion-referenced test which the author states can be used for several purposes. Some criterion-referenced tests are norm-referenced, such as the Stanford Diagnostic Tests in reading and mathematics. This study investigated the possibility of providing a norm reference for the Brigance Screen for kindergarten to enhance appropriate referrals to Special Education and to determine how the Brigance Screen meets the criteria for developmental screening and readiness testing mandated by Tennessee State law.

The results of this investigation revealed that the scores on the Brigance Screen for kindergarten were not distributed symmetrically. In addition to the asymmetrical distribution, it was only possible to score one standard deviation above the mean on two subtests. The means are near the maximum possible score on all subtests. The frequency distribution revealed that 46 per cent of the sample scored above 90, out of a maximum of 100 points. These negatively skewed distributions limit the interpretive statements which can be made concerning a particular score.

On the Brigance Screen approximately 70% of the scores fall between the mean and one standard deviation above the mean. This is approximately twice the number that would

fall in this range on a normal curve distribution. Approximately 14 to 18 per cent of the scores fell between the mean and one standard deviation below the mean. This is approximately half the number expected in a normal distribution. The results of this investigation revealed that neither subtest scores nor the total test score were normally distributed. The clustering of scores near the maximum possible score can be interpreted to mean the tasks are simple for the majority of students and high scores do not mean above average performance. It is also not possible to determine if high scores are actually normal performance or above normal performance for the entering kindergartner. The negatively skewed curve does not resemble a normal distribution and inhibits the use of the Brigance Screen as a norm-referenced test.

In evaluating the test to determine if it meets the criteria for a good norm-referenced test, the Brigance Screen falls short in several areas. The subtest scores and total test score do not tell how much most children know or how well developed their skills are because the mean is so near the total possible score on each subtest. This test is not appropriate to measure average or above average performance. It is only discriminatory when measuring below normal performance. The total score does not give a clear indication of general knowledge because of the arbitrary scoring system. Some items are weighted heavier than others

with no rationale provided. The ranking system suggested implies the test may be interpreted as a norm-referenced test. Because of the poor distribution of scores this ranking system may be interpreted erroneously. The items on the Brigance Screen are diffused widely across several different developmental and achievement areas, thus resembling some normed tests. But the number of items in each subtest are too limited to adequately assess lower and higher levels of development and achievement. This limits its use as a developmental screening test.

The purpose of a normed test is to indicate a student's degree of learning or level of development as compared with a typical student. The intent of the Brigance Screen is to imply this type of information by ranking student scores, then placing students in preschool, low, average, or high kindergarten. Since the study indicated the scores were not normally distributed, this sort of grouping is not justified.

Referrals for evaluation at the early kindergarten level are based on suspected developmental delays, rather than delays in achievement. The scores on the Brigance Screen are virtually useless for this purpose because the necessary information about what is normal is unavailable and can only be speculated. The subtests which measure developmental areas are limited in item number and are mastered by the majority of students. This distribution of

scores would most likely lead to many false negative interpretations. There are no validity studies to support the suggested cut off score or studies to validate the accuracy of the instrument in identifying students in need of further evaluation. Children who receive low scores are usually tried in the regular kindergarten for several months before a referral is made. This trial placement is a more effective screening procedure than the test score. Only those who are extremely delayed are referred immediately, and this information is available after observation of one week in the regular classroom.

The Brigance Screen does not meet the standards for a good criterion-referenced test for several reasons. Criterion testing works well for mastery of skills. On the Brigance Screen some skills are measured adequately by a criterion-referenced test. These include rote memory tasks such as stating personal data, naming colors, and rote counting. Rote memory tasks are easily remediated by instruction. Visual-motor integration, visual perception, gross-motor skills, and language, are developmental in nature. These skills are incorporated in all curriculums, and mastery is hard to measure, although growth in each area is expected. Delays are not easily remediated by mere instruction. Growth and development play a large role in the improvement of these skills.

The total score does not represent a percent of

specific objectives mastered, as most criterion tests are interpreted. Because of the convenient score of 100, it is very easy to interpret lower scores as being a percent of 100. This is not true because of the arbitrarily weighted scoring system.

The Brigance Screen provides a limited number of objectives in each area assessed. Some subtests are comprised of only one question, such as Prints Personal Name. The student receives five points for printing his name correctly; however, there are no partial points given for the first letters. The student receives the same score if the name consists of three letters or ten letters. Students scoring low or high would have to be tested further in order to determine which objectives were mastered.

A criterion test is to be used with instructional procedures to insure certain objectives will be learned. Since the Brigance Screen is supposed to be a criterion referenced test, it should be easy to develop curriculum from the results. On the Brigance Screen the total score is useless for this purpose. Most important are the individual skills in which the students are weak. This information would involve careful study of individual subtest scores to develop a profile of the entire class.

Thus, approximately half of the subtests on the Brigance Screen can be legitimately assessed with a criterion-referenced test, and the other half would be more

appropriately assessed by a norm-referenced test. It appears the Brigance Screen tries to do too much by trying to screen for developmental delays, indicate reading readiness, and provide curriculum objectives.

Student evaluation was also suggested as a use for the Brigance Screen. This is a vague term and the specific type of evaluation was not discussed by the author. Student improvement could be measured, but since the test is mastered by the majority of students upon entering kindergarten, not much information can be gained by retesting with the Brigance Screen for kindergarten. Since the subtests and scoring method on the Brigance Screen for first grade are different, progress cannot be determined by comparing the two scores.

The final suggested use for the Brigance Screen is screening. The author does not define what is meant by screening, and as Meisels (1987) stated there are two distinct types of screening tests, reading readiness and developmental screening. The Brigance Screen has subtests that fit both categories. The total score received is confusing because it is difficult to interpret this score as mastery of reading and math readiness skills, or adequate physical and mental development for school entrance.

Since low scores are rare (only 16 per cent score below 70), these scores most likely signal problems for the entering kindergartner. Again, a careful look at the

child's background and scores on subtests must be made before referrals are made for more comprehensive testing. Children from culturally deprived backgrounds who have not attended preschool programs most likely will not score well on tests requiring rote memory. These are skills routinely taught in preschool. Also practice in fine-motor skills, following directions, and visual discrimination are included in preschool curriculums. Low scores for these children may signify lack of exposure rather than a specific learning problem.

Children achieving low scores, who have attended preschool and do not come from deprived backgrounds, are much more likely to be identified as having specific learning problems. Children with low scores are also usually identified by teacher observation during the first weeks of school.

Much time and effort are expended in administering the Brigance Screen individually to all entering kindergartners. This investigation supports only one possible use for the Brigance Screen for kindergarten: as a screening test for the early identification of moderate to severe learning problems. This information is not worth the expense, time, or effort when one considers the same information can be obtained from teacher observation after only a few weeks in school. All other suggested uses such as program planning, student evaluation, and grouping are not justified.

The intent of the Tennessee law is to provide a developmental screening profile for each student before entering first grade. There is no mention in the law of screening entering kindergartners. Since the Brigance Screen can not be normed due to its limited item selection, the test is not appropriate to use as a developmental screening test. A reliable, valid, appropriately normed test to assess the developmental areas of visual discrimination, auditory discrimination, fine motor, gross motor and social development should be found and used in place of the Brigance Screen. There are several new instruments on the market which contain normative data. This developmental screening test does not have to be administered during the first two weeks of school but could be administered any time during the kindergarten year.

The Brigance Screen has not been validated as a reading readiness test. There are no data to support that test results correlate to success in early reading programs. Data are not available to support the ranking system as valid for grouping. These validity studies should be conducted by the school system if it continues to use the test for these purposes.

In summary, the Brigance Screen is a limited criterion-referenced test designed to measure developmental, reading, and math readiness skills. Because of limited item selection, the distribution of scores does not resemble the

normal curve. It is inappropriate to use the Brigance Screen as a developmental screening instrument since interpretations are difficult to make. Students should not be grouped or denied entrance to school based on low scores. Using the Brigance Screen as a reading readiness test is also questionable. Because of the limited number of items in each subtest, additional testing is suggested throughout the manual to supplement its use. The manual also suggests further testing with two other Brigance inventories, creating a cumbersome and expensive process.

The administration of the Brigance Screen to entering kindergartners does not meet any of the criteria of the Tennessee State law. This early screening is not mentioned in the law. The test is not a valid developmental screening instrument for visual discrimination, auditory perception, or motor skills. And, finally, it is not needed to measure reading and math readiness, since these skills are adequately measured with the Basic First Curriculum.

Reviewing the usefulness of this early testing program is justified at this time. If an entrance test is felt to be needed by the teachers, other more valid instruments containing normative data should be considered to replace the Brigance Screen. If teachers choose to continue to use this test, construct validity studies should be conducted to determine if the test matches the curriculum. Studies to validate any grouping decisions should also be conducted.

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APPENDIX



CLARKSVILLE-MONTGOMERY COUNTY
SCHOOL SYSTEM



P.O. Box 867 • 501 Franklin St. • Clarksville, Tennessee 37041-0867 • Phone 615-648-56

July 13, 1988

Willie C. Cowan
Coordinator of Pupil Personnel

To Whom It May Concern,

Carol Ryan has been given permission to utilize the testing data from the Brigance K&l Screening Test administered to Kindergarten students in the Clarksville-Montgomery County School System. This data will be used to establish local norms for this instrument and to provide research data for a field study through Austin Peay State University.

It is understood that no name, identification number, or any other method of personal identification will be associated with this data in anyway, and that such methods of personal identification will not be used for data storage on electronic or nonelectronic media. In this way, the anonymity of the persons involved will be maintained. It is also understood that the data gathered will be used for the purpose of group statistical analysis and interpretations and will not be used for any other purpose not pertaining to the field study or to the use of local norms for screening purposes.

W. C. Cowan
Coordinator of Pupil Personnel

I understand, and agree to abide by, the provisions stated above.

Carol M. Ryan, M.A.
Certified School Psychologist
Graduate Student, A.P.S.U.

CMR:kk