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AN EXAMINATION OF THE USEFULNESS
OF THE BENDER GESTALT TEST IN THE
PSYCHOLOGICAL EVALUATION OF LEARNING
DISABLED YOUNG ADOLESCENTS

A Dissertation Presented

By

GORDON B. PARKER

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of

DOCTOR OF EDUCATION

February 1984

Education

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DEDICATION

To Susan and Matthew

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I had the support and cooperation of many people during the process of completing this study. The following are cited because their help was so significant.

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Anne Finck endured two long sessions of administering and scoring Bender Gestalt Tests.

Dot Lyman typed and helped with the editing of many revisions of this paper. I was fortunate to have her assistance.

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ABSTRACT

AN EXAMINATION OF THE USEFULNESS
OF THE BENDER GESTALT TEST IN THE
PSYCHOLOGICAL EVALUATION OF LEARNING
DISABLED YOUNG ADOLESCENTS

February 1984

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The purpose of this study was to investigate the usefulness of the Bender Gestalt Test in the identification of learning disabled young people 11 to 14 years old.

Twenty learning disabled young adolescents were matched with twenty nonlearning disabled (typical students) on the basis of age, sex, grade and I.Q. scores. Each young person was given the Bender Gestalt Test. All test results were scored with both the Koppitz and the Pascal and Suttell Scoring Systems. The time it took each subject to complete the test was recorded.

Significant difference was found between mean Bender Gestalt results for the two groups with both scoring

systems: Pascal and Suttell ($p < .001$), Koppitz ($p < .01$). Significant difference between the mean time taken by both groups to complete the test ($p < .05$) was also found.

It was concluded that the Bender Gestalt test is useful in identifying learning disabled young people ages 11 to 14 years old. It was further concluded that the Pascal and Suttell scoring system for the Bender Gestalt Test was the superior scoring system for this task.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	v
ABSTRACT.....	vii
Chapter	
I. INTRODUCTION.....	1
Problem Statement.....	1
Purpose.....	2
Significance.....	3
Definition of Term.....	3
II. LITERATURE REVIEW.....	6
Early History of the Test.....	7
Popularity and Use of the Bender Gestalt Test.....	10
Scoring Systems.....	12
The Pascal and Suttell Scoring System.....	13
Standardization.....	13
Use of the Pascal and Suttell Scoring System.....	14
The Koppitz Developmental Scoring System.....	16
The Koppitz Emotional Indicators Scale.....	18
Additional Uses of the Koppitz Scoring System.....	18
Use of the Pascal and Suttell and Koppitz Scoring Systems With Young People Ages 11-14 Years.....	20
Studies Which Employed Koppitz Scoring.....	21
Studies Which Employed Pascal and Suttell Scoring.....	31
Studies Which Compared the Two Scoring Systems.....	37
Summary.....	41

III. METHODOLOGY.....	44
Hypotheses.....	44
Hypothesis I.....	44
Hypothesis II.....	45
Hypothesis III.....	46
Setting of the Study.....	46
Selection of Subjects.....	47
Instrumentation.....	51
Procedure.....	51
Scoring.....	52
Analysis of Data.....	52
IV. RESULTS.....	54
Hypothesis I.....	54
Hypothesis II.....	56
Hypothesis III.....	57
Additional Findings.....	59
V. DISCUSSION.....	60
Hypothesis I.....	60
Hypothesis II.....	61
Hypothesis III.....	62
Implications.....	63
Limitations.....	65
Suggestions for Further Research.....	65
BIBLIOGRAPHY.....	67
APPENDIX A: Pascal and Suttell Bender Gestalt Scoring Items.....	75
APPENDIX B: Koppitz Bender Gestalt Scoring Items.....	77
APPENDIX C: Age Distribution Tables for the Learning Disabled and Typical Groups.....	79
APPENDIX D: I.Q. Score Distribution Tables for the Learning Disabled and Typical Groups.....	82
APPENDIX E: Tables Which Present Pascal and Suttell Scores for the Learning Disabled and Typical Groups....	85

APPENDIX F:	Tables Which Present Koppitz Scores for the Learning Disabled and Typical Groups....	90
APPENDIX G:	Tables Which Present Time Used To Complete the Test for the Learning Disabled and Typical Groups.....	93

LIST OF TABLES

1. Use of the Koppitz Bender Gestalt Scoring System With 11-14 Year Olds.....	32
2. Use of the Pascal and Suttell Bender Gestalt Scoring System With 11-14 Year Olds.....	36
3. Studies Which Compared the Koppitz and Pascal and Suttell Scoring Systems for the Bender Gestalt Test.....	39
4. Analysis of Variance Between Groups By Age.....	48
5. Grade Distribution.....	49
6. Analysis of Variance Between Groups By I.Q. Score.....	50
7. Analysis of Variance For the Learning Disabled and Typical Groups - Pascal and Suttell Scoring.....	55
8. Analysis of Variance For the Learning Disabled and Typical Groups - Koppitz Scoring.....	57
9. Analysis of Variance For the Learning Disabled and Typical Groups - Time Used To Complete the Test.....	58
10. Typical Group Mean Pascal and Suttell Scores By Age - Scorer 1.....	59
11. Age Distribution Learning Disabled Group.....	80
12. Age Distribution Typical Group.....	81
13. I.Q. Score Distribution Learning Disabled Group.....	83
14. I.Q. Score Distribution Typical Group.....	84
15. Scores For the Learning Disabled Group With the Pascal and Suttell Scoring System - Scorer 1.....	86
16. Scores For the Learning Disabled Group With the Pascal and Suttell Scoring System - Scorer 2.....	87
17. Scores For the Typical Group With the Pascal and Suttell Scoring System - Scorer 1.....	88
18. Scores For the Typical Group With the Pascal and Suttell Scoring System - Scorer 2.....	89

19. Scores For the Learning Disabled Group With the Koppitz Scoring System.....	91
20. Scores For the Typical Group With the Koppitz Scoring System.....	92
21. Time Used To Complete Test Learning Disabled Group.....	94
22. Time Used To Complete Test Typical Group.....	95

LIST OF ILLUSTRATIONS

1. The Bender Gestalt Test..... 8

C H A P T E R I

INTRODUCTION

This chapter shall introduce the dissertation. The central problem will be identified. The purpose and the significance of the study will be clearly stated. A definition of learning disabilities will be offered.

Problem Statement

The following authors have suggested that learning disabilities may be largely due to developmental delay: Bender (1970), Ackerman et al (1971), and Lerner (1981).

It has been demonstrated that children (ages 5 to 11) who have I.Q. scores which are significantly higher than their developmental Koppitz Bender Gestalt Test scores, are likely to be learning disabled (Koppitz, 1975).

It is widely accepted that learning disabilities and/or developmental delay are present in some people beyond age 11. None of the Bender Gestalt Test scoring systems which presently exist, were designed to measure developmental level in normal young people beyond 11 years old.

Psychologists who regularly employ the Koppitz Bender Gestalt scoring to help in the identification of learning disabled young people ages 5 to 10 years, would surely welcome a Bender Gestalt scoring system which could measure developmental level beyond the ceiling of the Koppitz system.

Many learning disabled young people are not identified while in elementary school (Lerner, 1981). Therefore, there is an obvious need for instruments which can help to identify learning disabled young adolescents. There is reason to believe, that significant difference between I.Q. scores and developmental level (as measured by the Bender Gestalt Test) would be indicative of learning disabilities in young people beyond age 11.

Purpose

The first purpose of this study was to examine the feasibility of using the Pascal and Suttell and the Koppitz Bender Gestalt Test Scoring Systems as measures of developmental level, and as screening devices to detect learning disabilities in young adolescents. The second purpose of this study was to examine the feasibility of identifying learning disabled young adolescents based upon the amount

of time they used to complete the Bender Gestalt Test.

Significance

There has been very little research conducted which examined the usefulness of the Bender Gestalt Test in the identification of learning disabled young people ages 11 to 14 years. There has also been very little research reported which examined the usefulness of the Pascal and Suttell Scoring System for the Bender Gestalt Test in the identification of learning disabled young people.

This study has provided some evidence of the potential usefulness of the Bender Gestalt Test in the identification of learning disabled young adolescents. Since many young people are not diagnosed as learning disabled until they are beyond elementary school, there is a definite need for a Bender Gestalt Scoring System that can measure developmental level in young adolescents.

Definition of Term

Before this study of learning disabled students was undertaken, it was important to establish a definition of learning disabilities. It appears that this term, and

others such as learning difficulties, are not always clearly defined in much of the literature reviewed by this author.

The definition of learning disabilities that was used in this study is the two part definition from Public Law 94-142 (USOE, August 23, 1977 and USOE, December 29, 1977):

"Specific learning disability" means a disorder in one or more of the basic psychological processes involved in understanding or in using language spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage.

1. The child does not achieve commensurate with his or her age and ability levels in one or more of seven specific areas when provided with learning experiences appropriate for the child's age and ability levels.
2. The team finds that a child has a severe discrepancy between achievement and intellectual ability in one or more of the following areas:

- a. Oral expression
- b. Listening comprehension
- c. Written expression
- d. Basic reading skill
- e. Reading comprehension
- f. Mathematics calculation
- g. Mathematics reasoning

C H A P T E R I I
L I T E R A T U R E R E V I E W

This chapter is devoted to a review of the literature which is relevant to this study. There is a brief history of the Bender Gestalt Test, followed by a description of the Pascal and Suttell and the Koppitz Scoring Systems for the test. Finally, there is a comprehensive review of the research which employed either of the two scoring systems with young people between the ages of 11 and 14 years old.

This author conducted a comprehensive review of the Bender Gestalt literature including computerized searches of: Dissertation Abstracts International (1952-1982), Psychological Abstracts (1966-1982), and Educational Resources Information Center (1966-1982). This review of the literature indicated that while the Bender Gestalt Test is widely accepted as a measure of developmental level and as a screening device for learning disabilities with children 5 to 11 years old, it is not often recommended for these purposes with young people of normal intelligence after age 11.

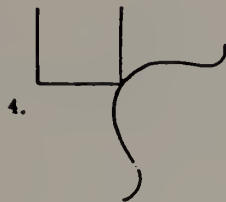
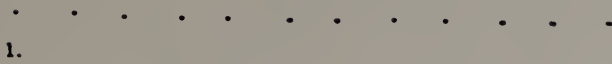
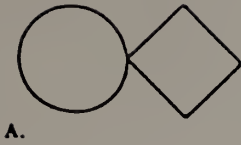
Early History of the Test

Wertheimer (1923) was involved very early in perceptual studies. He asked people that he considered to be normal individuals to describe certain figures, his goal being to arrive at a better understanding of normal visual gestalten.

Lauretta Bender (1932) adopted Wertheimer's figures in her work with psychotic patients. Rather than ask the patients to describe the figures, she asked them to draw them. This experience led to the development of the Bender Visual Motor Gestalt Test (See Figure 1) and Dr. Bender's monograph: A Visual Motor Gestalt Test and Its Clinical Use. An excerpt from the monograph (Bender, 1938) is helpful in understanding how Bender thought results of the test might be useful, especially in differential diagnosis between organic and functional disturbances:

The final gestalt is, therefore, composed of the original pattern in space (visual pattern), the temporal factor of becoming and the personal-sensory-motor-factor. The resulting gestalt is also more than the sum of all these factors. There is a tendency not only to perceive gestalten but to complete gestalten and to reorganize them in accordance with principles biologically determined by the sensory motor pattern of action. This pattern of action may be expected to vary in different maturation or growth levels and in pathological states organically or functionally determined. (p.5)

Figure 1
The Bender Gestalt Test



It seems that copies of the designs used in the Bender Gestalt Test were not commercially available until 1946. At that time, Bender also published a manual for the clinical use of the test. Prior to 1946 Bender shared her drawings with co-workers who used them in clinical work. After 1938, some workers were employing the test utilizing copies of the designs reproduced from Bender's 1938 monograph. Most notable among these was Hutt.

In 1945 Max Hutt was a senior instructor in the United States Army's Officer's Clinical Psychology Program at the Adjutant General's School at Fort Sam Houston, Texas. Hutt's speciality being projective technique and theory, he determined the Bender Gestalt Test had value as a projective assessment tool, as well as being valuable in the detection of organic brain damage (Hutt, 1977). Hutt was frustrated by the differences among various versions of the Bender Gestalt test cards available at that time. Hutt along with F. L. Wells of Harvard University was responsible for having a uniform set of test cards reproduced and distributed to psychologists throughout the Army. At the same time, he developed A Tentative Guide for the Administration and Interpretation of the Bender Gestalt Test (Hutt, 1945). Hutt, who became Chief Clinical Psychologist in the Surgeon General's Office of the United States Army shortly after his tentative guide was published, did much to interest other Army

psychologists in the use of the Bender Gestalt Test. Notable among these Army psychologists were Pascal and Billingslea. It seems fair to observe that Hutt was the first to receive wide spread recognition for utilizing the Bender Gestalt Test in ways other than those endorsed by Bender (1938, 1946, 1963, 1970). Many followed Hutt's lead and suggested various uses for, and approaches to, interpreting the Bender Gestalt Test.

Popularity and Use of the Bender Gestalt Test

For many years now, the Bender Gestalt Test has been reported to be among the most frequently used psychological tests (Sundberg, 1961; Lubin et al, 1971; Tolor and Brannigan, 1980). Various authors have suggested a multitude of purposes for which the test may be used. Some of the most frequently suggested are: differential diagnosis between organic damage and functional disturbance, developmental measure of visual motor skills, projective device, predictor of school achievement and screening device for learning disabilities, measure of intelligence in young children, measure of psychological disturbance and ego strength (See Bender, 1938; Pascal and Suttell, 1951; Koppitz, 1963, 1975; and Hutt, 1977). Taylor (1965)

suggested that there are three sources of variance in Bender Gestalt performance: general intelligence, spatial orientation, and personality adjustment.

When one begins to review the extensive literature concerned with the use of the Bender Gestalt test (The Eighth Mental Measurements Yearbook lists over 1,000 publications on the test), it becomes clear that there are many proposed uses and systems of interpretation for the test. Even those who are among the strongest advocates for the test, caution that it should be thought of only as a rough screening device which can be useful as one part of an evaluation procedure (Pascal and Suttell, 1951; Koppitz, 1975; Hutt, 1977).

Despite the limitations identified in the previous paragraph, the Bender Gestalt test has considerable respect and is very popular among psychologists. Kitay (1972) reviewing the Bender Gestalt for the Seventh Mental Measurements Yearbook stated:

The Bender Gestalt should be included, if possible, in every diagnostic examination of adults and children from age five because of its unique contributions to the evaluation of perceptual-motor functioning, neurological impairment, expressive styles, and maladjustment. Elaborate projective use of the instrument should be employed with caution. The instrument deserves its popularity among clinicians...(pp. 394-395)

Wechsler's (1952) rationale for the use of the Bender Gestalt appears still valid: "The clinical use of the test depends upon the fact that visual motor organization is a maturation process which may be arrested, regress after maturation is reached, and be variously affected by different neuropsychiatric disorders" (p. 92).

Scoring Systems

A major division among those who utilize the test, appears to be between those who employ a global inspection system to interpret the test, and those who subscribe to one of the many formal scoring systems. Scoring systems for the Bender Gestalt Test have been designed by Hutt (1945), Hutt and Briskin (1960), Billingslea (1948), Pascal and Suttell (1951), Peek and Quast (1951), Woltman (1950), Kitay (1950), Gobetz (1953), Okino (1956), Keller (1955), Stewart and Cunningham (1958), Koppitz (1958, 1960, 1963), Leogh and Smith (1961), Quast (1961), Hain (1964), Plenk (1968), Rimmer and Weiss (1972) and others.

As late as 1970, Bender has gone on record as being opposed to the use of formalized scoring systems with the Bender Gestalt Test. There is evidence that many psych-

ologists employ a global inspection approach to evaluating the test (See Tolor, 1968; Anastasi, 1982). Of the objective scoring systems available, the most widely used for adults (ages 15-50) is that of Pascal and Suttell. The most widely used with children (ages 5-10) is the Koppitz scoring system (Elliot, 1968; Koppitz, 1975; Eno and Deichmann, 1980; Tolor and Brannigan, 1980).

The Pascal and Suttell Scoring System

Pascal and Suttell agreed with Bender's (1938) contention that all of the designs of the test are correctly reproduced in their essential aspects, by the age of 11 years (assuming normal development). They were interested in using the Bender Gestalt Test to measure a factor other than developmental level. They theorized that they might design a scale which would distinguish between normal adults and those with psychogenic disorders. As a result they developed a very sensitive scale of one hundred five scoring items (reduced from two hundred originally considered).

Standardization

Pascal and Suttell standardized their scoring system

on a group of 474 people (ages 15-50) considered normal (271 with at least one year of high school and 203 with at least one year of college). Each of the 105 items was assigned a weight of 1, 2, 3, 4, 5, 8, according to the item's ability to discriminate between the normal group and a group of psychiatric patients (187 neurotics and 136 psychotics - all between the ages 15-50). The distribution developed from the standardization was translated from raw scores into Z scores (one scale for the high school and one scale for the college group).

Use of the Pascal and Suttell Scoring System

From the data resulting, Pascal and Suttell identified a range which suggests a person is probably in need of psychiatric services. They suggest a Z score of 60 (one standard deviation above the mean) as suspect. A quote from Pascal and Suttell (1951) will outline how they interpreted Z scores: "If for instance, a subject receives a Z score of eighty the chances, based on our data, are about one in one thousand that he will be normal. With a Z score of seventy-two the chances are one in one hundred that he will be normal. With a Z score of sixty-seven the chances are five in one hundred that he will be normal" (p. 35).

Billingslea (1965) reports several studies that successfully differentiated patient and non-patient groups using Pascal and Suttell's scoring system. Billingslea (1965) further acknowledges that the Pascal and Suttell scoring system has stood the test of time - "when the problem is to separate grossly the BG protocols reflecting major disturbance from those reflecting normal behavior" (p. 240). Anastasi (1982) is one of many who have attested to the fact that Pascal and Suttell's original study was carefully designed. Tolor and Shulberg (1963) cite many studies indicating high inter-rater agreement with this scoring system.

Pascal and Suttell provide detailed scoring instructions and 45 practice protocols - giving a person learning the scoring system an opportunity to check their own scoring against that of the authors. Pascal and Suttell suggest that with practice, one can learn to score a protocol using their system in 2 to 3 minutes. This author along with Elliott (1968) finds the scoring to require considerably more time (10 to 15 minutes), after much practice.

Even though the focus of their study was to design a scale which could be used to measure mental health, there are a number of additional points made by Pascal and Suttell

which are relevant to this review. Within the age range of 15 to 50, they concluded that drawing ability, intelligence (assuming it was in normal range or better), and sex had no effect on Bender Gestalt scores. At younger ages Pascal and Suttell had little doubt that Bender Gestalt performance is correlated with I.Q. They suggest there is a developmental trend in reproducing the designs that does not level off with their scoring system until about age 15. While Pascal and Suttell did provide limited data on 46 "normal" children ages 6 years 3 months to 9 years 3 months, they caution against use of their scoring system with children younger than 15. What they attempted to do with the data gathered from children was to show that certain deviations common to children below the age of 9, and not common to psychotic adults, were indicative of organic damage.

The Koppitz Developmental Scoring System

Elizabeth Koppitz became interested in developmental trends and their relationship to school achievement. She has published two books (1963, 1975) and numerous articles, which describe and report research on her Developmental Bender Test Scoring System. The system is composed of 30

scoring items. Although the 1975 scoring manual was revised, individual items were not changed. They were merely described in more detail than in 1963. The normative sample for the Koppitz developmental scoring (1963) was made up of 1,104 public school pupils in Kindergarten to grade five. This original normative sample was criticized for not containing enough racial minorities. Koppitz (1975) presented new norms for her scoring system based on a sample of 975 elementary school pupils, which included a better representation of racial minorities.

Although Koppitz offers developmental norms for ages 5 years 0 months to 10 years 11 months in her 1963 sample, and norms for 5 years 0 months to 11 years 11 months in her 1974 sample, she points out in her latest book (Koppitz, 1975) that: "by age 9 most youngsters of average mental ability tend to have adequate visual-motor integration, so they can obtain a perfect or near perfect Developmental Bender Test Score" (p. 17). Koppitz (1975) contends that her developmental scoring system may prove valuable in use with individuals whose mental age is below 10 years. She cautions however, that her developmental scoring system is of little value once a child's visual-motor function has matured. She is critical of studies which employ the Bender Scoring System with groups of normal teenagers.

Koppitz (1975) cites many studies which concur with her earlier findings that there is no significant differences in developmental scores between boys and girls after Kindergarten. She does concede that there is some evidence of significant differences among developmental levels of various racial and socio-economic groups. She points out the desirability of employing local norms when possible.

The Koppitz Emotional Indicators Scale

Koppitz also developed a list of Emotional Indicators (based on data from 136 "normal" children and 136 children with emotional problems), that she felt were important when the Bender Gestalt was interpreted as a projective instrument. Ten Emotional Indicators were noted in Koppitz's 1963 book, two additions were made to the list in the 1975 book. Koppitz (1975) contends that unlike her developmental scoring system, the Koppitz Emotional Indicators are valid beyond the age of 11.

Additional Uses of the Koppitz Scoring System

In addition to yielding a developmental score and indicating the possibility of emotional difficulty, Koppitz

(1975) suggests that the Bender Gestalt Test can provide other information. The test can serve as a quick non-verbal intelligence test for children 6 to 8 years old. It can also serve as an indicator of learning disabilities.

Koppitz (1975) states:

Most pupils with learning disabilities reveal a significant discrepancy between their Bender Test Scores and their I.Q. scores; even learning disabled youngsters with good mental ability tend to show marked developmental lag or malfunction in visual-motor integration...(p. 128)

Koppitz contends that the Bender Gestalt can also serve as a rough screening device to separate groups of well functioning and not well functioning students. In an earlier work, Koppitz (1963) suggested specific neurological indicators (scoring items). By the time her 1975 work was published, Koppitz had determined that, the overall developmental score was as good an indicator of brain dysfunction as the specific neurological indicators.

Koppitz (1975) contends that the amount of time it takes a child to complete the test is an important consideration. The average time for elementary students being 6 minutes 20 seconds. Koppitz (1975) cites another study by Ackerman et al (1971) which indicated the average time necessary to complete the test for learning disabled students was 5 minutes 19 seconds, and for hyperactive students was 4 minutes 41 seconds.

Koppitz (1975) cites over 20 studies which reported high inter-scorer reliability with her scoring system.

It should be noted that the Koppitz scoring system for the Bender Gestalt Test is much easier to use and learn than the more complicated Pascal and Suttell scoring system.

Use of the Pascal and Suttell and Koppitz Scoring Systems
With Young People Ages 11-14 Years

Even though neither the Koppitz nor the Pascal and Suttell scoring systems was designed for use with young people between 11 and 14 years old, there are a considerable number of references in the literature to those scoring systems being employed with the age group in question. In certain instances, the various researchers offer solid reasoning for employing the scoring system with the age group 11 to 14. In other instances no rationale at all is offered. There appears to be many more cases in the research literature using the Koppitz system with 11 to 14 year olds, than the Pascal and Suttell Scoring System. In this author's opinion, this is so, primarily because of the relative simplicity of scoring a Bender using the Koppitz system, in comparison to using the Pascal and Suttell system. Koppitz (1975, 1981) states clearly that her

scoring system reaches its ceiling with normal children by age 11 (and in some cases much younger). Pascal and Suttell on the other hand, caution against the use of their scoring system with school age children only because it was normed on an age group of 15-50.

In reviewing the relevant literature, 15 instances of the Koppitz scoring system being used with age group 11 to 14 were identified. Four instances of the Pascal and Suttell scoring system being used with the same age group were identified. Four studies were identified which compared the two scoring systems with the age group 11 to 14.

Studies Which Employed Koppitz Scoring

Four studies used the Koppitz Developmental Scoring System with mixed groups which included children older than 11 years. Baker and Thurber (1976) compared results of the Bender Gestalt (Koppitz scoring), the reading section of the Wide Range Achievement Test, and the Information subtest of the WISC, for 147 "disadvantaged" (low socio-economic standing) Anglo-Americans ages 6 to 14 years 11 months. Their findings supported those of Koppitz (1964, 1973) suggesting the Bender Gestalt is not

useful in predicting school achievement beyond age 9, even with "disadvantaged" students. Joestring (1977) analyzed data on 147 students who had been referred for "learning difficulties." The age range for this group was 6 to 16 years 1 month. Joestring suggested that her study confirmed Koppitz's (1975) contention that children who have few errors on the Bender (Koppitz scoring) tend to fall into the average range of intelligence. Fineberg et al (1979) compared the results of 21 subjects aged 8 years 6 months to 15 years 11 months on the Berry Buktenica and Bender Gestalt Test. Each of the subjects was a "mental health outpatient." Results showed that the Bender consistently yielded higher developmental age scores than the Berry. Rogers (1980) attempted to determine the correlation between Koppitz developmental scores and recall ability for Bender figures with 304 children age 5 to 14. He concluded that the recall phase is of doubtful utility in assessing intellectual functioning in children. It is clear to this author, that each of the four studies cited employed the Koppitz scoring system with age ranges that Koppitz (1975) specifically stated the scoring system should not be used with.

Two studies utilized the Koppitz scoring system with subjects whose chronological ages were above the Koppitz

range. In these two cases, however, the subject's mental ages made the use of the Koppitz scoring system still appropriate (See Koppitz, 1975). McConnell (1970) reviewed Bender test data for 120 patients. The subjects chronological ages ranged from 5 years 4 months to 25 years, however their mental ages were all within the Koppitz range. A "reasonably clear diagnosis" already existed for each subject. Subjects were identified as to their level of organicity (substantial, minimal and non-organic). They were also identified as belonging to one of four categories of emotional disturbance. McConnell determined that with his subjects, developmental scores related significantly to organic but not emotional disturbance. It was however impossible to differentiate non-organics from minimal organics in this study. Overlap of developmental scores and specific brain-injury items (Koppitz, 1963) raised questions concerning the need for a separate brain-injury scoring scale. (Koppitz, 1975, concurred with that finding.) In this study emotional indicators were unrelated to emotional or organic factors. In other words the number of emotional indicators did not correspond with the severity of the emotional problem, but Koppitz (1975) does not claim this to be the case.

McConnell acknowledges that individual emotional indicators may still be fruitful signs of certain emotional or behavioral tendencies. Maloney and Ward (1970) were able to successfully differentiate between 18 severely retarded adolescents diagnosed as functional. (Although there was overlap between individual results within the two groups.) They employed a modified version of the Koppitz scoring system which used a correct score rather than an error score.

Three studies compared normal subjects with special population groups using Koppitz scoring on Bender Gestalt Test and included young people age 11 to 14. Lingren (1969) examined a group of 20 "disabled readers" and a group of 20 "normal readers." The groups were matched for sex, I.Q., and chronological age (range 8 to 14). The two groups were compared with respect to performance on the Bender Gestalt, Wepman Auditory Discrimination Test and a visual-motor matching and speed task. No significant difference was found between the two groups on the Bender Gestalt Test. Lingren states that his results indicate that differences in form perception between normal and dyslexic children only are observed to occur for the most part in younger children. This author contends that it is the Koppitz scoring system, and not the Bender

Gestalt Test, that is not as sensitive to developmental levels in older children. Parsons et al (1971) confirmed the usefulness of the Koppitz developmental score as an acceptable indicator of organicity in children. This study used a group of 30 young people age 5 years 7 months to 18 years who had been previously diagnosed "neurologically impaired." The researchers matched this group for age and sex with 30 young people who had no history of brain damage. Oliver and Kronenberger (1971) investigated the general use of the Koppitz scoring systems with subjects 11 to 15 years. More specifically, the study examined the use of the Koppitz system with brain damaged, emotionally disturbed and a normal control group. Significant difference was found between each of the three groups on both the developmental scoring system and those items Koppitz (1963) associated with brain damage. The emotional indicators suggested a significant difference between the normal group and the other two groups. However, the emotional indicators did not significantly differentiate between the brain damaged and emotionally disturbed groups. Two of these last three studies showed significant differences between normal children over 11 and special populations. The fact that normally developing children have no difficulty obtaining

perfect or near perfect scores on the Koppitz Scoring of the Bender Gestalt had already been well established (Koppitz, 1975).

In each of the six remaining studies which employed the Koppitz system with the 11 to 14 age group, the scoring system was used with a special or unique population group.

Holroyd (1966) determined that both the Quast and Koppitz scoring systems had some very limited value in identifying brain damage (10 of 25 identified correctly). The age range for the subjects in this study was 7 years 6 months to 16 years 2 months. Children were selected from a pool previously evaluated at the University of Minnesota Hospitals. Children were identified as brain damaged based upon medical records, neurological examinations and/or EEG results. Holroyd fails to indicate in her article if there was any particular age range which the Koppitz scoring system was either more or less successful in identifying subjects with brain damage.

Hartlage (1970) examined the problem of differential diagnosis between young people with dyslexia, minimal brain damage, and emotional disorders. She chose 81 children ages 6 years 9 months to 14 years 4 months who had been referred for evaluation to a University Medical

Center Pediatric Neurology Clinic. Cases in which children had been clearly and exclusively diagnosed as belonging to one of the three groups mentioned were included. Bender Koppitz interpretations and neurological findings were in agreement 17 of 31 times with the dyslexic group, 20 of 25 times with the ED group and 16 of 25 times with the MBD group. Hartlage concluded that while the Bender has value in differentiating normal from organic children, and emotionally disturbed from organic children, it is of little value in the identification of dyslexic children in a mixed sample. This study is open to criticism from many angles. Hartlage chooses to accept the three classification categories assigned by "a University Medical Center." Yet definitions for these three diagnostic categories are certainly not universally agreed upon. In fact, certain views of learning disabilities consider L.D. individuals to have some sort of brain impairment (Lerner, 1981). And, once again, it should be noted that Koppitz (1975) does not recommend the use of her scoring system with those whose mental age is beyond 11 years.

Paul (1971) determined that the WISC and Bender (Koppitz total developmental score) together were good predictors of reading performance for a group of learning disabled students ages 6 to 13.

Money and Nurcombe (1974) tested 76 aborigines children ages 12 to 14 from the north coast of Australia. They employed the Bender Gestalt (Koppitz scoring) and the Draw-A-Person with these young people. Their results suggested that members of other ethnic cultures should not be measured against American/European norms. These young people displayed a slight maturational lag when compared to western norms. The authors caution that false positives are likely if evaluators do not consider cultural factors. The authors suggest that their findings are extremely relevant to the testing of students from minority cultures in the United States as well. The authors further suggest that what may appear to be a learning disability, "may unsuspectedly be the specific response of a particular child to his family's inchoate, covert, and paradoxical tradition, directive, or taboo against a specific facet of learning." This study appears to have added additional confirmation, that there is difference among particular ethnic groups performance on the Bender Gestalt. The study might have been even more valuable had the authors used a younger age sample. It has already been established that the Koppitz scoring system is more sensitive below the age of 9. In this study the authors were comparing their results to results of the

Koppitz sample at the ceiling of the scale.

Power (1975) compared a group of 34 learning disabled pre-adolescents (ages 7 to 10) and a group of 34 learning disabled adolescents (ages 12 to 15). In each case the subjects I.Q. was at least 80. She examined WISC, WRAT, EEG, and Bender Gestalt (Koppitz scoring) results. Also considered were referral information, behavioral reports, and parental reports. Power (1975) appears to have a very weak justification for use of the Koppitz scoring system: "The age level scores using the Koppitz scoring system range from five years zero months to ten years eleven months. It was assumed that adolescents who had visual-motor difficulties would score within the norms of the test, and those who did not were considered to be functioning within the normal range" (pp. 47-48). Of the 34 "learning disabled" adolescents, only four scored below the upper age limit of the Koppitz system. Power determined that the Bender Gestalt Test was one of the variables in her study for which the two learning disabled groups did not "manifest similar characteristics." Power (1975) further offered that "Either the adolescent population of this study had earlier perceptual-motor difficulties and were able, through maturation or copying techniques, to resolve them or they did not have previous

perceptual-motor difficulties" (p. 96). She later acknowledges that Bender results of the adolescent group could possibly be the result of the norms for the test (Koppitz scoring) being too low to discriminate adolescents with perceptual-motor difficulties. In this author's opinion that is certainly the most logical assumption.

In 1981 Koppitz published an article on the use of the Bender Gestalt Test and the Visual Aural Digit Span Test with learning disabled middle school pupils (ages 12 to 14). The study compared 100 "normals" and 100 "learning disabled" (of at least low-average ability). Koppitz concluded that the two tests together were useful in identifying children at the middle school level with serious learning disabilities. Koppitz (1981) did affirm that her developmental scoring system was still of limited value with this age group:

This study demonstrates the diagnostic value of the Developmental Scoring System on the Bender Test in identifying groups of middle school pupils with serious learning disabilities who were functioning below the ten year old level. The Developmental Scoring System was not able to discriminate between the Bender Test records of youngsters with less severe learning problems in the resource room group and control group. (p. 98)

In this study the learning disabled group also had a higher

incidence of two or more Koppitz Emotional Indicators. The value of this study is that it points out that the Koppitz scoring system can help to identify the more severe learning disabled (or developmentally delayed) youngster even at the middle school level. The danger of the study, is that while Koppitz acknowledges that her system is not really sensitive at this age level, she is, in a sense, promoting the use of the scoring system at the middle school level.

Studies Which Employed Pascal and Suttell Scoring

It is interesting to note that three of the four studies using the Pascal and Suttell scoring system with the age range 11 to 14 were done prior to the Koppitz system becoming widely used. Baroff (1957) tested mildly retarded adolescents. He reported discriminating successfully seven different mental age levels with this group. This study offered some minimal evidence that the Pascal and Suttell system could be used with mildly retarded individuals and could contribute to obtaining a mental age for such individuals.

Armstrong and Hauck (1960) tested 98 children from a child guidance clinic. The children ranged in age from

TABLE 1
Use of the Koppitz Gender Gestalt Scoring System With 11-14 Year Olds

Researchers	Age Groups	Special Population	Number of Subjects	Examined the Use of the B-G (Koppitz Scoring) as a screening device to identify	Other tests used in study	Findings
Baker & Thurber, 1976	6-14.11	Disadvantaged	147	School Achievement	WRAT WISC - Information	Useful only below age 9
Joestrang, 1977	6-16.1	Learning Difficulties	147	I.Q.	-	Children with few errors on B-G tend to be average in I.Q.
Fineberg, 1979	8.6-15.11	Mental Health Outpatient	21	Developmental level	Berry Buktenica	B-G yielded higher developmental age scores
Rogers, 1980	5-14	None stated	304	Intellectual Functioning	Recall Ability for B-G B-G Designs	Recall ability for B-G figures is of doubtful utility to 1.d. I.Q.
McConnell, 1970	5.4-25	Patients with Mental Ages Between 5 & 11	120	Organicity, Emotional Disturbance	-	Developmental scores related significantly to organic but not emotional disturbance
Maloney & Ward, 1970	Adolescents	Organic Retarded Functional Retarded	18 16	Organic vs. Functional Retarded (modified scoring employed)	-	Modified scoring system useful in differentiating between the two groups
Lingren, 1969	8-14	Disabled Readers Normal Readers	20 20	Disabled vs. Normal Readers	Hepman Auditory Disc. A visual-motor matching and speed task	No significant difference between two groups
Parsons et al, 1971	5.7-18	Neurologically Impaired Normals	30 30	Neurologically Impaired	-	Useful to determine organicity in children

TABLE 1 cont.

Researchers	Age Groups	Special Population	Number of Subjects	Examined the Use of the B-G (Koppitz Scoring) as a screening device to identify	Other tests used in study	Findings
Oliver & Kronenberger, 1971	11-15	Brain Damaged Emotionally Disturbed Normal Controls	12 12 12	Brain Damage Emotional Disturbance	-	Useful to separate normals from B.D. and E.D. Not useful to separate B.D. from E.D.
Holroyd, 1966	7.6-16.2	Brain Damaged	25	Brain Damage	Quast Scoring B-G	Both scoring systems had very limited value
Hartlage, 1970	6.9-14.4	Dyslexics Emotionally Disturbed Minimal Brain Dysfunction	31 25 25	Dyslexics Emotional Disturbance Minimal Brain Dysfunction	-	Useful to identify E.D. and MBD but not to id. dyslexia
Paul, 1971	6-13	Learning Disabled	91	Reading Performance	WISC	The two tests together were useful in predicting reading performance of L.D
Money & Nurcombe, 1974	12-14	Australian Aborigines	76	Developmental Level in a Non-western Society	Draw-A-Person	Western norms not valid with this population
Power, 1975	7-10 12-15	Learning Disabled Learning Disabled	34 34	Learning Disabled	WISC, WRAT, EEG, Reports	B-G not useful to identify L.D. adolescents
Koppitz, 1981	12-14	Learning Disabled Normals	100 100	Learning Disabled	Visual Oral Digit Span Test	Two tests together useful in i.d. of L.D.

6 to 12. The authors determined that their findings coincided closely with those of Pascal and Suttell for children between 6 and 9 years. This study also offered some results for Pascal and Suttell's scoring system with children 9 to 12 years. The study suggests that there is a developmental trend with this scoring system in ages 6 to 12.

Matunas (1960) used the Bender Gestalt (Pascal and Suttell scoring) along with the Benton Visual Retention Test and the Marble Board Test. Subjects in the study were males aged 10 to 15 who were psychiatric patients. She determined that the Bender Gestalt did not significantly discriminate between psychotic children with organic brain pathology. While Matunas appears to have done as much as possible to insure that children were correctly placed in the two groups based on organic involvement, there is always room for doubt with such classifications. Even so, results of this study certainly suggest that the Bender Gestalt (Pascal and Suttell scoring) is of questionable value in discriminating between the two groups in this study.

Grow (1980) attempted to fill in the gap which exists between the Koppitz and Pascal and Suttell scoring systems. He offered a downward revision of the Pascal and Suttell

scoring system for young people ages 12 to 14. He employed a system which provided for translating raw scores to T scores. His sample was made up of 135 middle school pupils. These young people were solicited as a result of being acquainted with Utah college students. The method of recruiting the sample certainly leaves this study open to the criticism that this was not a true random sampling of the particular age group. Grow considered the relationship of the occupation of a child's family's primary breadwinner to the test results. Based on some very broad occupational categories, he determined that this was not a relevant factor in Bender Gestalt performance. The value of this part of the study seems highly questionable. Grow also determined that sex was not a significant factor in test performance for this age group. While this study is far from perfect, it is the first large scale attempt to develop Pascal and Suttell norms for this age group in the United States. It also clearly demonstrated a developmental trend for Pascal and Suttell scores for this sample between the ages 12 to 14 years old.

TABLE 2

Use of the Pascal and Suttell Bender Gestalt Scoring System With 11-14 Year Olds

Researchers	Age Group	Special Population	Number of Subjects	Examined the Use of the B-G (Pascal and Suttell Scoring) as a screening device to identify	Other tests used in study	Findings
Baroff, 1957	Adolescents	Mildly Retarded	Not Stated	Intelligence/Mental Age	-	B-C score useful in determining mental age
Armstrong & Hauck, 1960	6-12	Clients of Child Guidance Clinic	98	Developmental Level	-	There is a developmental trend in B-G scores of 6-12 year olds
Matunas, 1960	10-15	Male Psychiatric Patients	34	Group of Psychotic Children with Organic Brain Pathology	Benton Visual Retention Test, Marble Board Test	B-C not useful in identifying organic psychotics from non-organic psychotics
Grow, 1980	12-14	Middle School Pupils	135	Developmental Level	-	Tentative P & S norms for age Group 12-14

Studies Which Compared the Two Scoring Systems

Next to be considered are the studies which used both the Koppitz and the Pascal and Suttell scoring system with the age range 11 to 14.

Cellura and Butterfield (1966) compared two groups of mildly retarded, institutionalized children (aged 14 to 17). The groups were matched on chronological age, mental age and I.Q. Mental ages and I.Q. were obtained from Peabody Picture Vocabulary Tests. Cellura and Butterfield determined that "at least for retarded adolescents, there would appear to be no relationship between reading achievement and BG scores after the effects of C.A., M.A., and I.Q. have been eliminated" (with either scoring system). Results of this study are somewhat questionable since mental age and I.Q. were determined only by results of the Peabody Picture Vocabulary Test. Anastasi (1982) states that this test measures only one segment of intelligence.

Sternlight et al (1968) compared two matched groups (age and I.Q.) of organic retardates and cultural-familial retardates. Ages in the group ranged from 12 to 20 years. They determined that the Pascal and Suttell scoring system significantly differentiated the two groups. The

Koppitz scoring system and the Memory for Designs Test did not. The authors suggest this may be due to the greater sensitivity of the more complicated Pascal and Suttell scoring system for the Bender Gestalt Test.

Elliott (1968) compared the use of the Pascal and Suttell scoring system and Koppitz Emotional Indicators. His sample included three groups of 11 to 14 year olds with 40 in each group matched for age, education, sex and I.Q. One group was identified as normal, one as containing neurotics, and one as containing psychotics. Elliott determined that both scoring systems can be extended to this age range. The distribution of scores was similar to that of the original populations cited by Koppitz and Pascal and Suttell. With some overlap, both systems of scoring the Bender Gestalt, did differentiate between normal and patient populations in this age group. Neither system could successfully differentiate neurotic and psychotic populations. Elliott determined that the Koppitz Emotional Indicators Scoring System, which is much simpler to score, worked at least as well for differentiating between the two populations at this age range. Aside from the fact that this study included only 120 young people, and, aside from the fact that neurotic, psychotic, and normal (Pascal and Suttell's original groupings) are

TABLE 3
 Studies Which Compared the Koppitz and Pascal and Suttell Scoring Systems
 For the Bender Gestalt With 11-14 Year Olds

Researchers	Age Group	Special Population	Number of Subjects	Examined the Use of the B-G (Koppitz and Pascal and Suttell Scoring) as a screening device to identify	Other tests used in study	Findings
Cellura & Butterfield, 1966	14-17	Mildly Retarded Institutionalized	30	Reading Achievement	Peabody Picture Vocabulary Test	Neither scoring system was useful for this task
Sternlight et al, 1968	12-20	Institutionalized Retarded	60	Organic vs Cultural-Familiar Retardates	Memory for Designs	Only the P&S scoring system significantly differentiated between the two groups
Elliott, 1968	11-14	Normals Neurotics Psychotics	40 40 40	Normals Neurotics Psychotics	-	Koppitz Emotional Indicators are as good as P&S at this task. Both systems differentiate normals
Kawaguchi, 1970	5-17	Japanese School Children	477	Developmental Level	-	P&S offers developmental trends to 17. Koppitz only to age 9.

somewhat vague categories, the study appears to have been carefully designed.

Kawaguchi (1970) compared the Koppitz and Pascal and Suttell scoring systems for 477 Japanese children aged 5 to 17. She concluded that with both systems, children's Bender errors decrease remarkably between ages 5 and 6 years. In her study the Koppitz system reaches a developmental plateau at age 9. There was in this study a clear developmental trend with the Pascal and Suttell scoring system up to age 17. She determined that the Pascal and Suttell scoring system was superior to that of Koppitz (Kawaguchi, 1970): "because the former can catch the qualitative change of development more in detail, even though it has too many factors to score easily" (p. 58). Kawaguchi's study provides norms for both scoring systems in the age range studied. The use of these particular norms with North American children may lead to false conclusions. Tiedeman (1971) stated that Japanese children at age 7 are far more superior in Bender Gestalt test performance than children from the United States and 12 other countries that were reviewed.

Summary

A number of conclusions can be drawn from reviewing the studies cited in this chapter. It appears that there are no differences between the Bender Gestalt protocols of males and females. There are significant differences reported between Bender Gestalt protocols of various ethnic, cultural, and socio-economic groups. The time it takes a person to complete the Bender Gestalt test is often thought to be important in interpreting the test results. Koppitz (1975, 1981) suggests that when Bender Gestalt results appear to lag behind I.Q. test results, learning disabilities may exist.

Both the Koppitz Developmental Scoring System and the Pascal and Suttell Scoring System appear to reflect clear developmental trends. This is true for the Koppitz scoring system until somewhere between the ages of 9 and 11. This is true for the Pascal and Suttell scoring system until somewhere between ages 15 and 17. Neither scoring system has been recommended in the research reviewed for use below the age of 5.

The Pascal and Suttell scoring system is, by far, more complex and difficult to score in comparison to the Koppitz. At the same time the Pascal and Suttell scoring system

appears to be the more sensitive of the two in measuring visual motor development.

The Koppitz Developmental Scoring System has been misused many times, when it was employed with children of normal intelligence over the age of 11. There is no evidence to warrant an upward revision of the Koppitz scoring system with children of normal intelligence (Emotional Indicators excepted) in the research reviewed. There is ample data provided in the research reviewed, for a downward revision of the Pascal and Suttell scoring system.

The following points are considered to be valid based upon research reviewed in this chapter:

1. The Koppitz Developmental Bender Scoring System is useful in measuring developmental level in school age children up to a level of 9 to 11 years old.
2. Although the Pascal and Suttell Bender Scoring System was not designed to measure developmental level, it is capable of performing this task at least up to a level of age 15 for school age children.
3. There is ample evidence to demonstrate that significant differences between I.Q.

level and Koppitz developmental Bender scores is indicative of learning disabilities in children ages 5 to 11.

4. There is evidence which suggests that learning disabled young people tend to complete the Bender Gestalt in less time than normal children of the same age.

C H A P T E R I I I

METHODOLOGY

This chapter will present the hypotheses tested in this study. This was a validation study which examined the usefulness of the Bender Gestalt Test in discriminating learning disabled from nonlearning disabled young adolescents. This chapter describes: the setting of the study, the instrumentation, the testing procedure, the scoring procedure, and the statistics that were used in analyzing the data.

Hypotheses

Hypothesis I

There will be a significant difference between the mean Bender Gestalt Test scores of a group of learning disabled young people ages 11 to 14 and a matched group of students using the Pascal and Suttell Scoring System for the Bender Gestalt Test.

Koppitz (1975, 1981) has demonstrated that learning disabled young people ages 5 to 11 tend to make more errors

than nonlearning disabled young people of the same age. The research cited in Chapter II suggests that the Koppitz Developmental Scoring System reaches a ceiling for normal children between the ages of 9 and 11. The research cited in Chapter II suggests that the Pascal and Suttell Scoring System is capable of measuring development in normal children until somewhere between the ages of 15 and 17. There appears to be ample reason to suspect that the Pascal and Suttell Scoring System will be useful in detecting learning disabilities in older children.

Hypothesis II

There will not be a significant difference between the mean Bender Gestalt Test scores of a group of learning disabled young people ages 11 to 14 and a matched group of young people using the Koppitz Developmental Scoring System.

Koppitz (1981) reports that her scoring system is only useful in the identification of severely learning disabled young people beyond the age of 11. Since the Koppitz Scoring System is only capable of measuring normal development up to 9 to 11 years, this system cannot identify subtle and moderate developmental lags in young adolescents.

Hypothesis III

There will be a significant difference between the mean time used to complete the Bender Gestalt Test by the group of learning disabled young people ages 11 to 14 and a matched group of young people.

Ackerman et al (1971) has demonstrated that the amount of time used to complete the Bender Gestalt Test is a useful indicator of learning disabilities in young children. Therefore there is ample justification for this hypothesis.

Setting of the Study

The setting chosen for this study was Mohawk Trail Regional High School (grades 7-12) and its five affiliated elementary schools. These schools serve nine very small rural towns in Western Franklin County, Massachusetts. Less than one percent of the population of the schools are minorities. In 1982, 59% of the graduates of Mohawk Trail Regional High School went on to higher education. Manufacturing, agriculture and seasonal tourism provide most of the employment in the area.

Selection of Subjects

All students ages 11 to 14 in this school system who had been clearly identified as learning disabled in reading and/or writing, by a special education team were included in the study. Each of these 20 students were in regular education classes for some of the day. Each of these students spent one to three 50 minute periods per day in special education resource rooms.

A group of 20 nonlearning disabled students (hereafter referred to as typical students) ages 11 to 14 were chosen from what remained of the total school population. These young people were matched to the learning disabled group on the basis of age, sex, grade and I.Q. scores. I.Q. scores for the learning disabled group were based upon results of the Wechsler Intelligence Scale for Children-Revised. I.Q. scores for the typical group were based upon results of the Short Form Test of Academic Aptitude. No students with full scale I.Q. scores below 90 were included in this study.

The mean age for the learning disabled students in this study was 13.085 years. The standard deviation for this group was .985 years. The mean age for the typical students in this study was 13.095 years. The standard

deviation for this group was 1.046 years. Individual age distribution data is presented in Appendix C. Results of one way analysis of variance indicated that there was not a significant difference between the two groups based upon age.

TABLE 4
Analysis of Variance Between Groups By Age

Source	df	SS	MS	F
Between Groups	1	.0010	.0010	.001*
Within Groups	38	39.2150	1.0320	
Total	39	39.2160		

*p > .05

The two groups were matched exactly on the basis of sex. Each group contained 16 males and 4 females.

The two groups were matched exactly on the basis of grade level. Table 5 provides grade distribution data.

TABLE 5
Grade Distribution

Grade	Frequency	Relative ^a Frequency
Learning Disabled Group		
5	2	10.0
6	5	25.0
7	5	25.0
8	7	35.0
9	1	5.0
Typical Group		
5	2	10.0
6	5	25.0
7	5	25.0
8	7	35.0
9	1	5.0

Note. Mean = 7.0, Mode = 8.0 for both groups

^aRelative frequency is equal to percentage of the total group.

The mean I.Q. score for the learning disabled group was 106.25. The standard deviation for this group was 7.601. The mean I.Q. score for the typical group was 106.9. The standard deviation for this group was 8.626. Individual I.Q. scores data is presented in the tables which appear in Appendix D. Results of one way analysis of variance indicated that there was not a significant difference between the two groups based upon I.Q. scores.

TABLE 6
Analysis of Variance Between Groups By I.Q. Score

Source	df	SS	MS	F
Between Groups	1	4.2250	4.2250	.064*
Within Groups	38	2511.5500	66.0934	
Total	39	2515.7750		

*p > .05

Instrumentation

The standard Bender Gestalt cards as supplied by the Psychological Corporation were used in this study. Reliability, validity and standardization of the two scoring systems has been amply reviewed in Chapter II.

Procedure

The author of this study and one other examiner administered the Bender Gestalt Test individually to the subjects from both groups. Each of the two examiners were certified School Psychologists. Each had many years of experience using the Bender Gestalt Test in practice. The Bender designs were presented to the subjects with the following instructions: "I have nine simple designs for you to copy. You are to copy them free hand, without sketching on this paper. There is no time limit to this test." A beginning and ending time was recorded for each subject. This was done in a manner such that it was not obvious to the subject.

Scoring

Each of the Bender Gestalt protocols was scored independently by the two psychologists according to the instructions outlined by Pascal and Suttell (1951) and Koppitz (1975).

Analysis of Data

The task for Hypothesis I and Hypothesis II was to determine if there was a significant difference between the mean scores of learning disabled and the non-learning disabled group with the two scoring systems.

The task for Hypothesis III was to determine if there was a significant difference between the mean time used to complete the test by the learning disabled and non-learning disabled group.

The same statistical procedure was used to test Hypothesis I, Hypothesis II, and Hypothesis III. The statistical procedure used was one way analysis of variance. This procedure showed whether in each case the two groups were significantly different. Significance was accepted at the five percent level of confidence.

Statistical Package for the Social Sciences (SPSS)

Version 8.3 - May, 1980 was the system of computer programming used to analyze the data reported in Chapter IV.

C H A P T E R IV

RESULTS

This study was designed to examine whether or not the Bender Gestalt Test appeared to have promise as a screening device to detect learning disabilities in young people ages 11 to 14 years old. In this chapter results of the statistical analysis for each hypothesis are reported. Additional findings are also reported.

Hypothesis I

The first hypothesis stated: There will be a significant difference between the mean Bender Gestalt Test scores of a group of learning disabled young people ages 11 to 14 and a matched group of students using the Pascal and Suttell Scoring System for the Bender Gestalt Test.

Interscorer reliability (Pascal and Suttell Scoring) for the two independent scorers was found to be .99. The Pearson Product Moment Correlation Coefficient was used as the measure of interscorer reliability. Appendix E contains tables which list individual scores for both groups.

Since interscorer reliability was so high, one way analysis of variance between the mean scores of the two groups was based upon scorer 1 only. Hypothesis I was supported. The learning disabled group had a mean Pascal and Suttell score of 44.3. The standard deviation for this group was 17.327. The typical group had a mean Pascal and Suttell score of 18.8. The standard deviation for this group was 10.232. The difference between means of the two groups for Hypothesis I was significant at the .001 level.

TABLE 7

Analysis of Variance For the Learning Disabled
and Typical Groups - Pascal and Suttell Scoring

Source	df	SS	MS	F
Between Groups	1	6502.5000	6502.5000	32.118*
Within Groups	38	7693.4000	202.4579	
Total	39	14195.9000		

* $p < .001$

Hypothesis II

The second hypothesis stated: There will not be a significant difference between the mean Bender Gestalt Test scores of a group of learning disabled young people ages 11 to 14 and a matched group of young people using the Koppitz Developmental Scoring System.

Interscorer reliability (Koppitz Scoring) for the two independent scorers was found to be .97. The Pearson Product Moment Correlation Coefficient was used as the measure of interscorer reliability. Appendix F contains tables which list individual scores for both groups.

Since interscorer reliability was so high, one way analysis of variance between the mean scores of the two groups was based upon scorer 1 only. Hypothesis II was not supported. There was a significant difference between the mean Bender Gestalt Test scores for the learning disabled group and the typical group. The learning disabled group had a mean Koppitz score of 2.150. The standard deviation for this group was 1.565. The typical group had a mean Koppitz score of .850. The standard deviation for this group was .745. The difference between the means of the two groups for Hypothesis II was significant at the .01 level.

TABLE 8
 Analysis of Variance For the Learning Disabled
 and Typical Groups - Koppitz Scoring

Source	df	SS	MS	F
Between Groups	1	16.9000	16.9000	11.247*
Within Groups	38	57.1000	1.5026	
Total	39	74.0000		

*p < .01

Hypothesis III

The third hypothesis stated: There will be a significant difference between the mean time used to complete the Bender Gestalt Test by the group of learning disabled young people ages 11 to 14 and a matched group of young people.

Hypothesis III was supported. The mean time for the learning disabled group was 4.065 minutes. The standard deviation for this group was 1.303 minutes. The mean time for the typical group was 5.945 minutes. The standard

deviation for this group was 3.463 minutes. Appendix F contains tables which list individual times for both groups. One way analysis of variance revealed that the difference in mean times for the two groups was statistically significant at the .05 level. It must be noted however, that one subject in the typical group spent an extremely long time to complete the test. That one subject skewed the results considerably in the direction of significance.

TABLE 9

Analysis of Variance For Learning Disabled
and Typical Groups - Time Used To Complete the Test

Source	df	SS	MS	F
Between Groups	1	35.344	35.344	5.234*
Within Groups	38	256.615	6.753	
Total	39	291.959		

*p < .05

Additional Findings

The Pascal and Suttell Scoring System was not designed to measure development. It appears however, based upon the research reviewed in Chapter II, that the scoring system can measure development in normal children up to at least age 15. Even though there were only 20 young people in the typical group in this study, there was a clear developmental trend observable for this group between ages 11 and 12, and between ages 12 and 13. Table 10 presents mean scores by age for typical group (Scorer 1).

TABLE 10
Typical Group
Mean Pascal and Suttell
Scores By Age - Scorer 1

Age	N	Mean Score
11	2	28.000
12	7	22.571
13	6	14.500
14	5	15.000

C H A P T E R V

DISCUSSION

This chapter will begin with discussion of the results of each hypotheses tested. Implications which may be drawn based upon the data will be presented. The limitations of this study will be noted. Finally, suggestions for further research will be offered.

Hypothesis I

Although Pascal and Suttell did not design their Bender Gestalt Scoring System as a developmental scale, there is ample evidence in the literature which demonstrates that this scoring system can measure development in normal young people until at least age 15.

As was reported in Chapter IV, the difference between the mean scores of the two groups with the Pascal and Suttell Scoring System was significant at the .001 level. Another way to look at this same information will now be presented (based upon scorer 1). If we use a Pascal and Suttell Score of 35 as a cut off score for 11 year olds, assuming that any score beyond that is indicative of a

learning disability, we correctly identify two of two learning disabled young people. We do not incorrectly identify any of the two typical young people as being learning disabled.

If we use a Pascal and Suttell score of 30 as a cut off score for 12 year olds we correctly identify six of eight learning disabled young people. We incorrectly identify two of seven typical children as being learning disabled.

If we use a Pascal and Suttell score of 25 as being a cut off score for both 13 and 14 year olds, we correctly identify 9 of 10 learning disabled young people. We incorrectly identify 1 of 11 typical students as being learning disabled.

In all, using this system, we are able to correctly identify 17 of 20 learning disabled young people, while incorrectly identifying 3 of 20 typical young people as being learning disabled.

Hypothesis II

Koppitz (1981) was not able to find significant difference between a group of "normals" and a partially mainstreamed group of learning disabled middle school

pupils based upon Koppitz Bender Gestalt Test scores. The learning disabled students in this study differed from Koppitz's 1981 sample of partially mainstreamed students in two significant areas. All of the students in this study were learning disabled in the area of reading and/or writing. Some of the students in Koppitz's 1981 group were learning disabled in the area of mathematics. All of the students in this study had full scale I.Q. scores above 90. The students in Koppitz's 1981 study had full scale I.Q. scores as low as 72.

As was reported in Chapter IV, the difference between the mean scores of the two groups with the Koppitz Scoring System was significant at the .01 level. If we use a Koppitz score of 2 as a cut off score (both scorers), we correctly identify 13 of 20 learning disabled students. We incorrectly identify 4 of 20 typical students as being learning disabled.

Hypothesis III

Ackerman et al (1971) found that the mean time elementary learning disabled students took to complete the Bender Gestalt Test, was one minute less than the mean time for her total elementary school sample.

As was reported in Chapter IV, the difference between the mean times used by the two groups to complete the Bender Gestalt Test was significant at the .05 level. However, one subject in the typical group skewed the results considerably in the direction of significance. Using a cut off score of below four minutes, we correctly identify 9 of 20 learning disabled young people, while incorrectly identifying no typical young people as being learning disabled.

Implications For Practice

Based upon the data presented in this study, the Bender Gestalt Test appears to have value as a screening device to detect learning disabilities within the age range 11-14 years old. This test certainly deserves a place in any test battery designed to identify learning disabled young adolescents.

The Pascal and Suttell Scoring System appears to be able to identify more learning disabled students than the Koppitz Scoring System. It should however be noted, that the Pascal and Suttell Scoring System is considerably more difficult to learn and use than the Koppitz Scoring System.

The Koppitz Scoring System is relatively easy to learn

and use. While it does not appear to be as useful for identifying learning disabled young adolescents as the Pascal and Suttell System, it still appears to have definite value as a screening device for this task.

After weighing the advantages and disadvantages of both scoring systems, this author supports the Pascal and Suttell System for use in test batteries designed to identify learning disabled young people ages 11-14. Even though it is more complicated to learn and use, it appears, based upon results of this study, to be a clearly superior scoring system for the task in question.

As long as many learning disabled young people are not clearly identified in elementary school, there will be a need for instruments which can measure developmental level in young adolescents. Psychologists who conduct evaluations on the age group in question, should make the effort to learn and use the Pascal and Suttell Scoring System for the Bender Gestalt Test.

The time which a student spends to complete the Bender Gestalt Test can be recorded and considered in a matter of seconds. Times below four minutes appear to be indicative of learning disabilities in this age group.

Limitations

Clearly the findings of this study are of limited value due to the relatively small number of subjects included in the study.

Findings of this study are limited to Mohawk Trail Regional High School and its affiliated elementary schools. The subjects of this study are not representative of any larger population group.

Suggestions for Further Research

This study should be replicated with a population that is both larger and more representative of the population of this country as a whole.

It has been clearly demonstrated that the Pascal and Suttell Scoring System for the Bender Gestalt Test can measure development at least until age 15. There is a need for a carefully designed study which produces norms for a downward revision of this scoring system to age 11. Below age 11, the Koppitz Scoring System for the Bender Gestalt Tests appears to provide an adequate measure of developmental level.

A well designed Bender Gestalt study might identify

certain Pascal and Suttell scoring items which are frequently scored for learning disabled young adolescents. Any simplification of the Pascal and Suttell Scoring System that did not significantly lower the accuracy found in this study would be very useful.

Pascal and Suttell designed their scoring system to identify adults (ages 15-50) who were in need of psychiatric services. Elliot (1968) demonstrated that this scoring system can be used successfully for the same purpose with 11 to 14 year olds. There is need for a study which examines whether or not the Pascal and Suttell Scoring System can successfully discriminate between learning disabled young adolescents and members of the same age group who are in need of psychiatric services.

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APPENDIX A

Pascal and Suttell Bender Gestalt
Scoring Items

SCORE SHEET—BENDER-GESTALT TEST

Name Age Sex

Education I.Q. Diagnosis

DESIGN 1

1. Wavy line (2)
2. Dot, dash, cir. (3)
3. Dashes (2)
4. Circles (8)
5. No. dots (2) each
6. Dbl. row (8)
7. Workover (2)
8. Sec. attempt (3 ea.)
9. Rotation (8)
10. Des. miss. (8)

Design Total

DESIGN 4

1. Asym. Crv. (3)
2. Break crv. (4)
3. Crv. not center. (1)
4. Curls (4)
5. Not joined (8)
6. Crv. rotation (3)
7. Touch-up (8)
8. Tremor (4)
9. Distortion (8)
10. Guide lines (2)
11. Sec. attempt (3 ea.)
12. Rotation (8)
13. Des. miss. (8)

Design Total

DESIGN 7

1. Ends no. join. (8)
2. Angles ext. (3)
3. Angles miss. (3)
4. Ext. scat. (3)
5. Dbl. line (1 ea.)
6. Tremor (4)
7. Distortion (8 ea.)
8. Guide lines (2)
9. Sec. attempt (3 ea.)
10. Rotation (8)
11. Des. miss. (8)

Design Total

DESIGN 2

1. Wavy line (2)
2. Dash or dots (3)
3. Shape cir. (3)
4. Cir. miss., ext. (3)
5. Cir. touch. (5)
6. Dev. slant (3)
7. No. col. (2 ea.)
8. Fig. on 2 lines (8)
9. Guide lines (2)
10. Workover (2)
11. Sec. attempt (3 ea.)
12. Rotation (8)
13. Des. miss. (8)

Design Total

DESIGN 5

1. Asymmetry (3)
2. Dot, dash, cir. (3)
3. Dashes (2)
4. Circles (8)
5. Ext. join. dot (2)
6. Ext. rotation (3)
7. No. dots (2)
8. Distortion (8)
9. Guide lines (2)
10. Workover (2)
11. Sec. attempt (3 ea.)
12. Rotation (8)
13. Des. miss. (8)

Design Total

DESIGN 8

1. Ends no. join. (8)
2. Angles ext. (3)
3. Angles miss. (3)
4. Ext. scat. (3)
5. Dbl. line (1 ea.)
6. Tremor (4)
7. Distortion (8 ea.)
8. Guide lines (2)
9. Workover (2)
10. Sec. attempt (3 ea.)
11. Rotation (8)
12. Des. miss. (8)

Design Total

DESIGN 3

1. Asymmetry (3)
2. Dot, dash, cir. (3)
3. Dashes (2)
4. Circles (8)
5. No. dots (2)
6. Extra row (8)
7. Blunting (8)
8. Distortion (8)
9. Guide lines (2)
10. Workover (2)
11. Sec. attempt (3 ea.)
12. Rotation (8)
13. Des. miss. (8)

Design Total

DESIGN 6

1. Asymmetry (3)
2. Angles (2)
3. Pt. crossing (2 ea.)
4. Crv. extra (8)
5. Dbl. line (1 ea.)
6. Touch-up (8)
7. Tremor (4)
8. Distortion (8)
9. Guide lines (2)
10. Workover (2)
11. Sec. attempt (3 ea.)
12. Rotation (8)
13. Des. miss. (8)

Design Total

CONFIG. DESIGN

1. Place. Des. A. (2)
2. Overlap (2 ea.)
3. Compression (3)
4. Lines drawn (8)
5. Order (2)
6. No order (8)
7. Rel. size (8)

Total

DESIGN TOTALS

- | | |
|--------------|---------|
| 1. | 5. |
| 2. | 6. |
| 3. | 7. |
| 4. | 8. |
| Config. | |

Total Raw Score

Standard Score

APPENDIX B
KOPPITZ DEVELOPMENTAL BENDER GESTALT
SCORING ITEMS

Bender-Gestalt Test
Developmental Score Sheet-Kopplitz

Name: _____ Time Completed: _____

Date: _____ Age: _____ Mean Time For Age: _____

Examiner _____ Critical Time Limit: _____ to _____

Figure A

1a. Distortion of Shape _____
1b. Disproportion of Size _____
2 Rotation _____
3 Integration _____

15

16

17a.

17b.

Figure 5

Distortion of Shape _____
Rotation _____
Integration-Shape _____
Integration-Line _____
not dots _____

Figure 1

4 Distortion of Shape _____
5 Rotation _____
6 Perseveration _____

Figure 6

18a. Distortion-Angles _____
18b. Distortion-No. Curves _____
19 Integration _____
20 Perseveration _____

Figure 2

7 Rotation _____
8 Integration _____
9 Perseveration _____

Figure 7

21a. Distortion-Size _____
21b. Distortion-Misshapen _____
22 Rotation _____
23 Integration _____

Figure 3

10 Distortion of Shape _____
11 Rotation _____
12a. Integration-Shape _____
12b. Integration-Lines _____
not dots _____

Figure 8

24 Distortion of Shape _____
25 Rotation _____

TOTAL _____

Figure 4

13 Rotation _____
14 Integration _____

Mean Score for Age and Sex (Pg.33)

Number of behavior indicators _____
Number of emotional indicators _____
Number of neurological indicators _____

APPENDIX C

AGE DISTRIBUTION TABLES FOR THE
LEARNING DISABLED AND TYPICAL GROUPS

TABLE 11
Age Distribution
Learning Disabled Group

Age ^a	Frequency	Relative Frequency
11.0	1	5.0
11.9	1	5.0
12.2	2	10.0
12.4	3	15.0
12.5	1	5.0
12.6	1	5.0
12.7	1	5.0
13.1	1	5.0
13.6	1	5.0
13.8	3	15.0
14.0	2	10.0
14.3	1	5.0
14.4	1	5.0
14.6	1	5.0

Note. Learning Disabled Group Mean = 13.085
Standard Deviation = .985

^aAges are in years and tenths of years

TABLE 12
Age Distribution
Typical Group

Age ^a	Frequency	Relative Frequency
11.0	1	5.0
11.3	1	5.0
12.1	1	5.0
12.2	1	5.0
12.3	2	10.0
12.5	2	10.0
12.8	1	5.0
13.1	1	5.0
13.2	1	5.0
13.6	1	5.0
13.7	1	5.0
13.9	2	10.0
14.1	1	5.0
14.2	1	5.0
14.3	2	10.0
14.6	1	5.0

Note. Typical Group Mean = 13.095
Standard Deviation = 1.046

^aAges are in years and tenths of years

APPENDIX D

I.Q. SCORE DISTRIBUTION TABLES FOR THE
LEARNING DISABLED AND TYPICAL GROUPS

TABLE 13
 I.Q. Score Distribution
 Learning Disabled Group

I.Q. Score	Frequency	Relative Frequency
91	1	5.0
93	1	5.0
98	2	10.0
100	1	5.0
101	1	5.0
103	2	10.0
104	1	5.0
108	2	10.0
111	1	5.0
112	5	25.0
115	1	5.0
116	2	10.0

Note. Learning Disabled Group mean = 106.25
 Standard Deviation = 7.601

TABLE 14
I.Q. Score Distribution
Typical Group

I.Q. Score	Frequency	Relative Frequency
92	1	5.0
93	1	5.0
95	1	5.0
97	1	5.0
99	1	5.0
101	1	5.0
103	2	10.0
107	1	5.0
108	1	5.0
109	1	5.0
110	2	10.0
111	1	5.0
114	1	5.0
115	1	5.0
117	2	10.0
118	1	5.0
119	1	5.0

Note. Typical Group Mean = 106.9
Standard Deviation = 8.626

APPENDIX E

TABLES WHICH PRESENT PASCAL AND SUTTELL SCORES
FOR THE LEARNING DISABLED AND TYPICAL GROUPS

TABLE 15

Scores for the Learning Disabled Group With the Pascal
and Suttell Scoring System - Scorer 1

Score	Frequency	Relative Frequency
18	1	5.0
24	1	5.0
26	1	5.0
28	1	5.0
30	1	5.0
32	1	5.0
36	1	5.0
37	2	10.0
44	2	10.0
45	1	5.0
47	1	5.0
49	2	10.0
54	1	5.0
61	1	5.0
69	2	10.0
87	1	5.0

Note. Mean = 44.3, Standard Deviation = 17.327

TABLE 16

Scores for the Learning Disabled Group With the Pascal
and Suttell Scoring System - Scorer 2

Score	Frequency	Relative Frequency
18	1	5.0
24	1	5.0
28	1	5.0
29	2	10.0
30	1	5.0
36	1	5.0
37	2	10.0
39	1	5.0
42	1	5.0
44	1	5.0
45	1	5.0
49	2	10.0
54	1	5.0
58	1	5.0
69	2	10.0
87	1	5.0

Note. Mean = 43.650, Standard Deviation = 17.187

TABLE 17
 Scores for the Typical Group With the Pascal and Suttell
 Scoring System - Scorer 1

Score	Frequency	Relative Frequency
0	1	5.0
3	1	5.0
8	2	10.0
10	1	5.0
12	2	10.0
16	1	5.0
18	1	5.0
20	3	15.0
21	1	5.0
25	1	5.0
26	1	5.0
27	1	5.0
29	2	10.0
34	1	5.0
38	1	5.0

Note. Mean = 18.8, Standard Deviation = 10.232

TABLE 18
 Scores for the Typical Group With the Pascal and Suttell
 Scoring System - Scorer 2

Score	Frequency	Relative Frequency
2	1	5.0
3	1	5.0
8	1	5.0
10	1	5.0
12	2	10.0
14	1	5.0
16	1	5.0
17	1	5.0
18	1	5.0
20	2	10.0
21	1	5.0
23	1	5.0
27	2	10.0
29	2	10.0
37	1	5.0
38	1	5.0

Note. Mean = 19.15, Standard Deviation = 10.049

APPENDIX F

TABLES WHICH PRESENT KOPPITZ SCORES FOR THE
LEARNING DISABLED AND TYPICAL GROUPS

TABLE 19
 Scores for the Learning Disabled Group
 With the Koppitz Scoring System

Score	Frequency	Relative Frequency
Scorer 1		
0	4	20.0
1	3	15.0
2	5	25.0
3	3	15.0
4	4	20.0
5	1	5.0
Scorer 2		
0	3	15.0
1	4	20.0
2	5	25.0
3	3	15.0
4	5	25.0

Note. Scorer 1 Mean = 2.150 Standard Deviation = 1.565

Note. Scorer 2 Mean = 2.150 Standard Deviation = 1.424

TABLE 20
 Scores for the Typical Group
 With the Koppitz Scoring System

Score	Frequency	Relative Frequency
Scorer 1		
0	7	35.0
1	9	45.0
2	4	20.0
Scorer 2		
0	8	40.0
1	8	40.0
2	4	20.0

Note. Scorer 1 Mean = .850, Standard Deviation = .745

Note. Scorer 2 Mean = .800, Standard Deviation = .768

APPENDIX G

TABLES WHICH PRESENT TIME USED TO
COMPLETE THE TEST FOR THE LEARNING
DISABLED AND TYPICAL GROUPS

TABLE 21
 Time Used to Complete Test
 Learning Disabled Group

Time ^a	Frequency	Relative Frequency
2.3	1	5.0
2.5	1	5.0
2.9	1	5.0
3.1	1	5.0
3.3	1	5.0
3.5	3	15.0
3.6	1	5.0
4.0	3	15.0
4.2	1	5.0
4.3	3	15.0
4.8	1	5.0
5.2	1	5.0
5.7	1	5.0
8.3	1	5.0

Note. Learning Disabled Mean = 4.065,
 Standard Deviation = 1.303

^aTime is in minutes and tenths of minutes

TABLE 22
 Time Used to Complete Test
 Typical Group

Time ^a	Frequency	Relative Frequency
4.0	2	10.0
4.2	2	10.0
4.4	1	5.0
4.6	1	5.0
4.7	1	5.0
4.8	2	10.0
5.0	1	5.0
5.5	2	10.0
5.8	1	5.0
6.0	1	5.0
6.1	2	10.0
6.2	1	5.0
6.3	1	5.0
6.6	1	5.0
20.1	1	5.0

Note. Typical Group Mean = 5.945,
 Standard Deviation = 3.463

^aTime is in minutes and tenths of minutes

